English

Film Processor
Operation Manual

PROTEC® Medizintechnik GmbH & Co. KG
Lichtenberger Strasse 35, D-71720 Oberstenfeld, Germany
Telephone: +49-7062-9255-0 e-mail: service@protec-med.com

Machine No.:	
Type:	
Date of installation:	
Issued:	April 2003/1.4

Subject to technical alterations

EU-Declaration of Conformity

PROTEC® Medizintechnik declares, that the product

Description:	OPTIMAX® 2010
Machine type:	X-Ray-Film Processor
Model no.	116x-y-0000 x is a number between 0 and 9, y is a number between 1 and 9

conforms to the following harmonized standards:

Safety:	IEC 61010-1:1990 + A1:92 + A2:95; DIN 1988 T4:12/1988; UL 3101-1; CSA 22.2-1010-1
EMC:	EN 50081 Part 1, 03/1993; EN 50082 Part 1, 03/1993

according to the regulations of:

- the Medical Device Directive 93/42/EEC “class 1”,
- the Low Voltage Directive 73/23/EEC and the
- EMC Directive 89/336/EG

PROTEC® Medizintechnik GmbH & Co. KG, Lichtenberger Strasse 35, D-71720 Oberstenfeld, Germany

Place and date of issue:
Oberstenfeld, 8. February 2002, Frank Baisch (Manager Research and Development)

ZERTIFIKAT

TÜV MANAGEMENT SERVICE

Die Zertifizierungsstelle
der TÜV Management Service GmbH

bescheinigt,
daß das Unternehmen

PROTEC Medizintechnik GmbH & Co. KG
Lichtenberger Straße 35
D - 71720 Oberstenfeld

für den Geltungsbereich

Filmentwicklungsmaschinen
und Zubehör

ein Qualitätsmanagementsystem eingeführt hat
und anwendet.

Durch ein Audit, Bericht-Nr. **QM-F-95/263**

wurde der Nachweis erbracht, daß die Forderungen der

DIN EN ISO 9001

erfüllt sind.

Zertifikat-Registrier-Nr.**70 100 F 263 TMS**

Mannheim, 10. November 1997

Zertifizierungsstelle der TÜV Management Service GmbH
Unternehmensgruppe TÜV Süddeutschland

Deutscher Akkreditierungs Rat
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TGA-ZM-07-92-00-0

English

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Information on Liability

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Introduction

You are the proud owner of a modern, automatic processor. Due to the precision roller transport system, both sheet and roll films can be processed. The automatic film registration is activated immediately when a film is fed in. The film materials are developed, fixed, rinsed and dried. With the easy to operate micro-processor, the processing conditions can be adjusted to suit the various film and chemical types. The developing solutions are temperature-regulated, circulated and automatically replenished.

This Operation Manual contains the most important instructions for installation, operation and servicing of this machine. Please read the provided information carefully to ensure reliable and satisfactory operation of your film processor.

Technical Specifications

Film transport:	Continuous roller transport system
Film formats:	In general: Sheet and roll films up to 35.8 cm (14.1") width; Roll films with leader from 70 mm (2.8") width; Smallest film format 10x10 cm (4x4"). Mammography type 1161: For processing mammography films. Graphics-art type 1162: With cassette box (LxWxH) 35x13x12 cm (13.8x5.1x4.7") for processing roll films.
Processing capactiy:	129 films 24x30 cm (10x12") per hour (standard model, film fed in crosswise, at 90 s)
Process time:	1.5-3 min.; in 0.1-min. steps adjustable.
Linear speed:	28-56 cm/min., depending on selected process time.
Developing time:	25-49 s, depending on selected process time.
Tank capacities:	Developer, fixer and washing 5 litres each gal
Circulation system:	Developer and fixer are continiuously circulated by a circulation pump
Replenishment:	Automatic by film surface measurement in relation to processed film; replenishment can be deactivated; time replenishment can be activated.
Developer temperature:	Adjustable 28 - 37 °C (82.4 - 98.6 °F)
Fixer temperature:	Adjusted to developer temperature by heat exchanger.
Water connection:	Permissible water pressure 2 - 10 bar (29 - 145 psi), permissible water temperature 5 - 30 °C (41 - 86 °F).
Water consumption:	1.9 litre per minute when processing. Water save mode: 0.9 litre per minute
Drain capacity:	7 litres per minute
Noise level:	Less than 58 dB(A).
Heat emission:	During processing approx. 1.4 Kj/s.
Environmental conditions:	1 Temperature 5 - 40 °C (41 - 104 °F), ventilated room, room temperature should be lower than set bath temperature. 2 Relative humidity lower than 80 % up to 31 °C (88 °F), linearly decreasing to 50 % at 40 °C (104 °F) 3 Height above sea level less than 2000 m (6666 ft.) 4 Indoor use
Pollution degree:	2
System protection:	IP 20

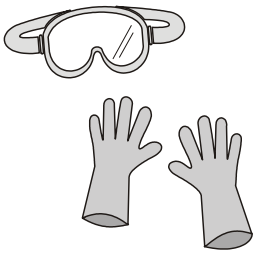
Electrical connections:	Electrical specifications are indicated on model nameplate. Type 116x-1-y000: 220 - 240 V~, 8.8 A, 50 Hz Type 116x-2-y000: 220 - 240 V~, 8.8 A, 60 Hz Machine tested for overvoltage category II according to IEC 1010 (EN 61010, VDE 0411) Type 116x-4-0000: 110 / 120 V~ ±10%, 12 A, 60 Hz.Machine tested for overvoltage category II according to UL 3101 and CSA 22.2-1010
Power consumption:	Stand-by: 0.12 kWh Processing: 1.4 kWh
Weight (processor):	Empty 35 kg (77 lbs) Filled 50 kg (110 lbs)
Dimensions (LxWxH):	77x59x42 (* 112) cm (30.3x23.2x16.5 (* 44.1)")
Floor space required:	0.45 m^2 (4.8 sqft)

* Height incl. optional working table resp. base cabinet.

Safety Instructions

To ensure the safe operation of this processor, installation and use should always conform to the instructions contained in this manual.

The developer and fixer chemicals used in the processor should be handled according to the manufacturers instructions. In general: Non-diluted chemicals are caustic. For this reason, chemicals should be handled very carefully. Avoid contact with skin, always wear protective clothing, gloves and glasses when handling the chemicals - for example, when mixing and refilling. Also when taking the racks out for cleaning or servicing. In case of chemicals getting into the eyes, rinse eyes immediately with cold, running water for approximately 15 minutes, and contact a doctor afterwards. Inhalation of chemicals can be dangerous to your health and should be avoided. For this reason, always ensure that the room in which the processor is installed is adequately ventilated.



Environmental regulations regarding the storage and disposal of waste chemicals should be obtained from the local water authorities and complied with.

Before opening the processor switch off the unit and unplug it from the electrical socket. Service and repairs must be performed by trained service technicians only. Use only manufacturers replacement parts.

Installation

1. Requirements for installation

a. Fresh water connection: Stop cock with 3/4" outer-thread diameter (washing machine connection), Water pressure 2 - 10 bar (29 - 145 psi).

b. Drainage connection: Plastic tube - inner diameter 50 mm (2”) or larger. A ventilated syphon which serves as odour preventor should be included in the planning. The drainage tubes should be installed with a fall of minimum 5 %. Local Water Authorities regulations should be complied with.

c. Electrical connection: Fused wall socket with earth connection according to electrical data (see technical specifications, page 5). It is also required to install an earth-leakage switch (with 25 A / 30 mA nominal error current).

Electrical connections should be carried out according to regulations by an electrician.

2. Installation of processor

Unpack the Processor. Remove cover and transport securing brackets on the sides of the roller racks. Remove roller racks - start with the dryer rack.

In the standard version the OPTIMAX® 2010 is delivered as a tabletop processor with a three part floorplate. If the machine is upgraded with the optional stand or cabinet, both small side parts have to be removed.

Table-top installation

In the event that the processor is to be installed on a work top or table, the adjustable feet should be unscrewed and levelled.

Attention!
Machine should not be installed on table-top without adjustable feet,as this would block the ventilation openings under the machine and cause overheating.

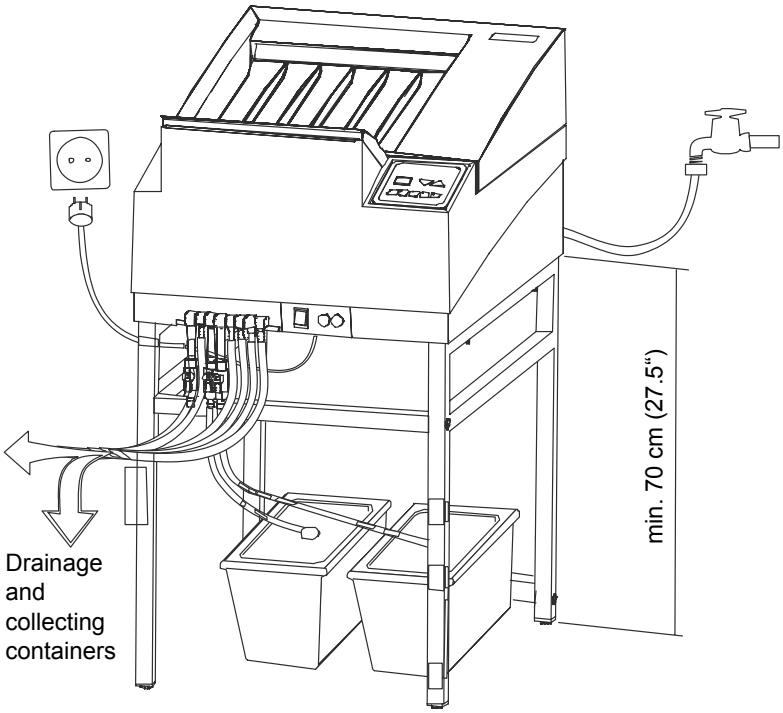
Installing on processor stand or base cabinet

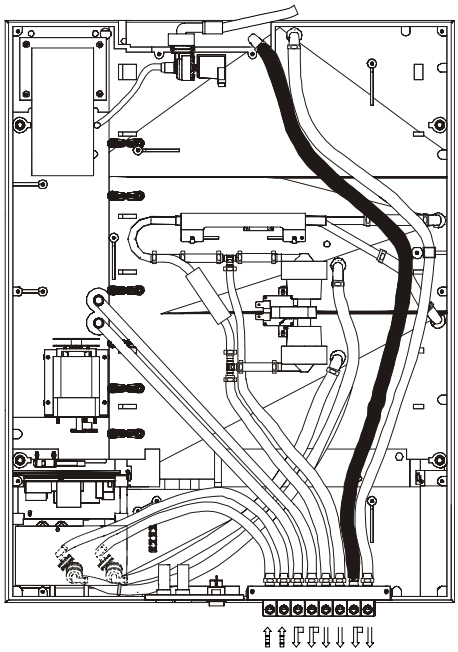
In the event that the processor is to be installed on the stand or cabinet (optional accessory), the processor will be mounted directly to it. Mount processor according to manual included with stand or cabinet (the adjustable feet inside the accessory bag are not required). First dismantle both small side parts of floorplate.

Finally the processor needs to be levelled:

Place spirit level across the sidewalls of processor and adjust the levelling feet accordingly. Replace the racks into the processor and close the latches.

3. Connecting the processor





Water connection:

Fit water-inlet hose (grey) at the rear of the machine and connect to the prepared fresh water supply.

Water overflow:

The water overflow hose (∅ = 16 mm) will be mounted at the back side of the machine. Mount the hose as described in the next paragraph.

Remark:

It is also possible to mount the overflow connection at the front side of the unit. For that the enclosed pre-mounted hose must be assembled inside the unit and connected to the overflow angle at the front side. At delivery this overflow angle connection is only a dummy (see illustration).

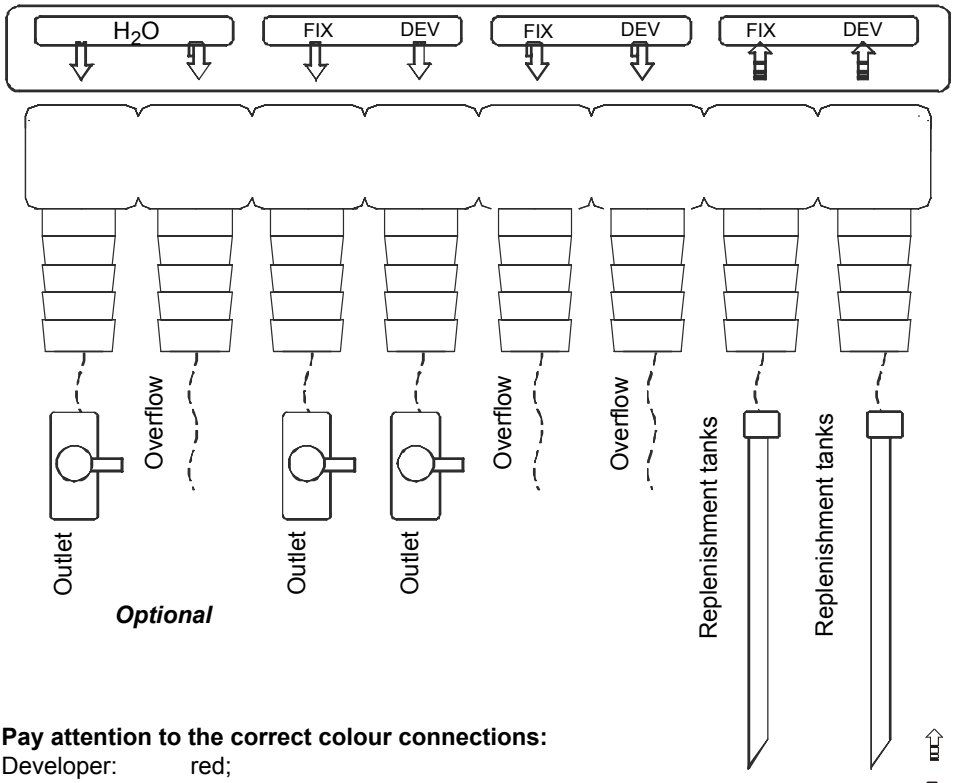
All other hoses (see diagram page 8): Connect the enclosed hoses according to colour system onto the front of the machine. Put hose clip (enclosed in accessory bag) over hose end, before attaching to connection. Warm up hose end (with hot water or lighter) and push onto the respective connection. Finally push clip over hose and connection.

Cut hoses to required length. Then integrate the stop cocks into the three drainage hoses in such a position, that they are easy to reach.

Connect the suction pipes to the hose ends for the replenishment tanks using hose clips. Put suction pipes through cover opening into respective replenishment tanks and snap them in.

The overflow and drainage hoses from the developer and fixer should be guided into their respective collecting containers. The overflow and the drainage of the water can either be guided into the drainage syphon or into respective collection containers.

Hose connections



Pay attention to the correct colour connections:

Developer:	red;
Fixer:	blue;
Water:	clear

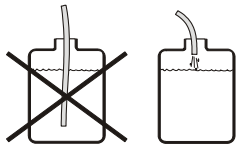
⇧ Replenishment

⇩ Overflow

⇓ Outlet

Danger of Overflow!

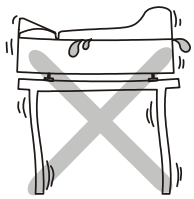
Use the included cable binders (accessory bag) to secure the hoses.Fix all hose ends which guide into syphon or collecting container, so that they do not drop into the liquid.



Very important:

The hose piping should be straight (without the hoses going up and down) with a constant fall.The hoses should be as short as possible and without bends and kinks.This is very important for the water overflow hose.Bad piping work will cause the machine to overflow!

Inform yourself of the local water board regulations regarding drainage.These regulations may differ from information in this manual, but they should be complied with.



If the machine is installed table-top, ensure that the table is stable enough and does not wobble.

Initial Operation

Test run

Important!
Processor should not be run dry!

a. Close the three drainage stop cocks and fill the tanks and replenishment containers with water. Open water inflow tap. Connect electrical socket and switch the machine on. Water now flows into water tank. The circulation pump activates, however the hosing of the machine must be ventilated.

b. Ventilation of the replenishment pump:
Enter the Manual mode and start there the replenishment pump. Keep running the pump as long as no more air bubbles rise in the tanks.

c. Ventilation of the circulation pump:
The circulation pump runs after switching on the machine and ventilates itself. If this does not occur, a loud running noise can be heard. Switch the machine off again. Open the stop cocks of the developer and fixer for five seconds and switch machine on again. Repeat this procedure until no more air bubbles are visible in the developer and fixer baths and until the circulation pump runs quietly.

d. Check all hose connections for leakage. Switch machine off and drain water out.

Fill processor with chemicals

Prepare chemicals inside the replenishment containers according to manufacturers instructions.

Fill up processor manually

By using a suitable container, pour chemicals into the respective tanks. First the fixer and then the developer. Caution: when filling, be sure that chemicals do no splash from one bath into another. When fixer solution is mixed with developer solution, the developer chemical is destroyed.

Caution! When filling up the processor by hand, take care that no chemicals are spilled into the gap of the film detection switch or the control panel. These parts could be damaged.

Snap each suction pipe into the respective cover of it's replenishment container and close it carefully. Place containers under processor.

Using replenishment pump

Filling of processor can also be done by use of the replenishment pump (this takes much more time). Snap each suction pipe into the respective cover of it's replenishment container and close it carefully. Place containers under processor. Start the bath filling by activating the Autofill Function. The function will stop automatically if the correct bath level is reached. At the latest after 20 minutes the function is cancelled automatically. Limitation: The function may fill up tanks of developer and fixer to different levels. If this happens, then use a suitable container to fill up the tanks completely.

Operation

Short Overview and Control Panel

① Display working parameters
② Arrow button “Up” = increase parameter
③ Arrow button “Down” = decrease parameter

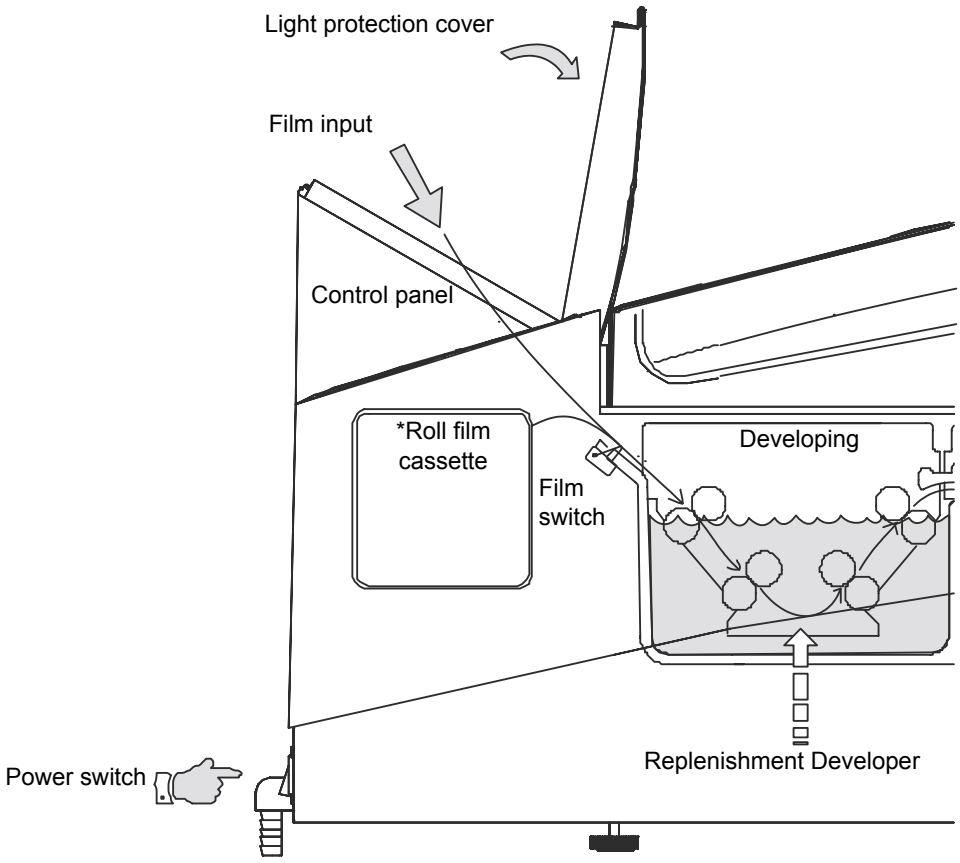
Mode Buttons

④ Processing time in minutes
⑤ Developer temperature in °C
⑥ Dryer power in %
⑦ Replenishment time in seconds

Important!

Safety function stops film transportation when cover is removed.Therefore keep cover placed on the machine when processing films.

*When processing roll films in cassettes pull approx. 15 cm of film out of the cassette and fold the corners (see page 17). Place cassette into cassette box and feed film into the infeed. Only machines with cassette box.



English

Before use...

1. Close water-drainage stop cock.
2. Open water tap.
3. Switch processor on.
4. Check liquid level in replenishment and drainage collecting containers.
5. Wait until the start-cycle has been completed or until Developer temperature is reached.
6. Run cleaning films through processor.

Working procedure

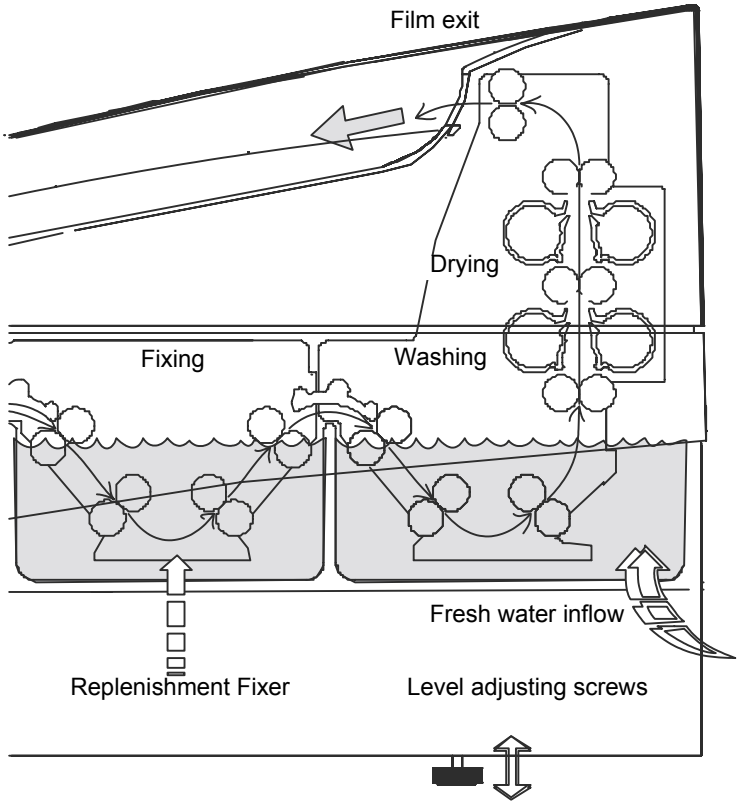
7. Processing films:Open light protection cover, insert film on left side of infeed tray and feed in, during infeed please watch the Infeeding-film-display "– –".

After work...

8. Switch processor off.
9. Close water tap.
10. Open water drainage stop cock

Stand-by mode:

When no film is being processed, the machine switches to Stand-by. The chemicals remain at a constant temperature. The film transport and water inflow activate at intervals to avoid crystalisation of the chemicals on the transport rollers. Entry of the next film is possible at any time.



Do not place any object on the processor.

Switching the Machine On

Before switching the machine on, open the fresh water tap and close the water drainage tap (under control panel). Then switch the machine on (main switch is situated under the control panel). Once the machine is switched on, a “Start-cycle” of three minutes duration is activated: A replenishment cycle is carried out, the water tank fills automatically and the chemical baths heat up. During this “Start-cycle” no films can be fed into the machine. The display shows two bars “– –” when the processor is not ready and no films can be fed in. This is the case during the “start-cycle” and also when the baths have not reached the temperature. Until the developer temperature is not reached, the developer temperature button (5) is flashing. It is possible that the chemical bath has not reached the required temperature even after the “Start-cycle” has been completed. You need to wait until the developer temperature is reached, before inserting films. Wait until the bars “– –” disappear from the display.

Automatic Mode

After completion of the “Start-cycle” and after a film-processing, the machine automatically goes into the stand-by mode. In the stand-by mode the processor can be started at any time by placing a film into infeed tray. Note that films can only be processed when the developer temperature is reached. When the display shows two bars “– –” no films can be fed into the machine. The temperature in the bath is too high or too low. However, when a film was fed into the machine, two bars with decimal points “–.–.”. To avoid a jamming of films wait before feeding the next film in until this display disappears (which is also signaled by an acoustic sound).

A film in the infeed-tray is registered by two film detection switches and the machine starts up. The film is pulled into the machine and transported through the developer, fixer and water baths. The remaining time of processing i.e. until the film finally leaves the machine is displayed, when no more film is in the infeed-tray and the processing time button was pressed. Each working-parameter can be called up on the display by pressing the respective mode-button, however, during processing, parameters cannot be altered. The temperature of the developer is automatically regulated. The replenishment rate of developer and fixer chemicals is activated according to the processed film-surface (film-surface measurement). The dryer is heated up to the adjusted value. The film is then dried in the dryer before passing out of the machine and falling onto the cover. The machine then goes into the stand-by mode. To keep the machine in working condition during the stand-by mode, the electronics have been furnished with two specialities: The Anticrystalisation Function and the Time Replenishment.

Anticrystalisation Function

During the stand-by mode, the film transport, the dryer ventilation, the dryer heating and the water inflow are activated every 20 minutes for a period of 20 seconds. This prevents the build-up of crystals on the rollers. This function cannot be switched off.

Time Replenishment (Anti oxidation function, Flood replishment)

Also during the stand-by, the developer chemicals are subject to change which causes their deterioration. By means of the time replenishment, a replenishment cycle is activated after 60 minutes without replenishment. With this function, the quality of the developer chemicals are maintained even when standing idle for long periods. The time replenishment can be deactivated.

Deactivation of time replenishment:

1. Switch processor off.
2. Press the buttons processing speed (4) and replenishment time (7) simultaniously and keep pressed.
3. Switch the machine on again and release the pressed buttons.
4. Activate and deactivate the time replenishment by pressing the arrow buttons (2 and 3). When “0” is set, the time replenishment is deactivated, when “1” is set, the time replenishment is activated.
5. For saving switch machine off again.

Working Parameters

The processing machine develops, fixes, rinses and dries the film materials automatically. The film and chemical requirements can be adjusted accordingly and stored in the control unit.

Display of working parameters:

1. Switch processor on.
2. Press the respective mode button (4-7) and keep pressed to display the required working parameter.

Press the respective mode button (4-7) and release to display the momentary value.

Setting the working parameters:

1. Switch processor on.
2. Machine must be in the stand-by mode and no film must be in the processor.
3. Press the respective mode button (4-7) and keep pressed: The display shows the set working parameter.
4. Change value by means of the arrow buttons (2 and 3) until required value appears on the display. The upward arrow button (2) increases and the downward arrow button (3) decreases the value.
5. Release the mode button.

Processing Time

The processing time, is the time, it takes the front end of a film from the infeed of the processor until it reaches the film exit. The processing time is set by the speed with which the film is transported through the machine. Depending on the requirements, this time can be varied from 1.5 minutes (90 seconds) to 3 minutes adjusted in 0.1-minute-steps (Adjusting processing time: see “Working Parameters” on page 13).

Processing and developer time relation		
Processing time (min)	**Developer time (s)**	**Infeed speed (cm/min)**
1.5	25	56
1.7	28	49
2.0	33	42
2.3	38	37
2.5	41	34
2.7	44	31
3.0	49	28

Developer Temperature

The developer temperature of the different film-materials depends on the developing time. The faster a film has to be developed, the higher the temperature must be. The developer temperature can be set between 28-37°C according to the individual requirement (Setting the developer temperature: see “Setting the working parameters:” on page 13). If the temperature is lower or higher than the set value, then the bath temperature button (5) is flashing and the display shows two bars “– –”. Before feeding a film into the machine, wait until the temperature has been reached and the displayed bars “– –” disappear.

The following chart demonstrates guide value relations between developer temperatures and processing times. Variations are possible depending on the various films and chemicals.

Processing time and developer temperature relation	
Processing time “Dry to Dry” (min (s))	**Developer temperature(°C)**
1.5 (90)	33 - 35
2.0 (120)	32 - 34
2.3 (138)	31 - 33
2.5 (150)	31 - 33
3.0 (180)	30 - 32

Dryer Temperature

The dryer temperature can not be adjusted in degrees centigrade. However the power of the dryer can be adjusted within a range of 10-99% (100%) according to the different film-materials. *“95”* is equivalent with 95% of the maximum power of the dryer heating. To avoid dryer spots on the film, the power of the dryer may not be set too high. Adjust the temperature so that the film just gets dry (Setting the dryer temperature: see “Working Parameters” on page 13).

Remark: Depending on mains voltage dryer temperatures above 65°C may under certain circumstances not be reached. The information in the table below indicates guiding values only. For some combinations of film materials, chemicals and ambient conditions the dryer power may have to be set differently from these recommendations.

Processing time and dryer power relation	
Processing time “Dry to Dry” (min (s))	**Dryer power (%)**
1.5 (90)	85 - 99
2.0 (120)	75 - 95
2.3 (138)	65 - 85
2.5 (150)	55 - 75
3.0 (180)	45 - 65

Replenishment Time

The replenishment of the developer and fixer chemicals is automatic. By means of the film detection switches at the film-infeed, the surface of the processed films are calculated and after 0.25 m^2 a replenishment cycle is automatically activated. The replenishment quantity can be adjusted by adjusting the replenishment time. The time can be varied from 10-99 seconds. It is possible to deactivate the replenishment by setting it to *“0”*. This is only recommended in special cases.

The chart below shows the replenishment time to be set for the requested replenisher rate per m^2 film surface. The standard setting is 40 sec. with 600 ml replenisher rate per m^2 film surface. The replenisher rate has to be adjusted depending on film material, chemicals and film throughput.

Replenishment time and Repl. rate relation

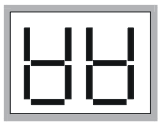
Replenisher rate (ml/m^2)	Replenisher time (s)	Replenisher rate (ml per cycle)
150	10	37.5
300	20	75
450	30	112.5
600	40	150
750	50	187.5
900	60	225
1050	70	262.5
1200	80	300
1350	90	337.5
1485	99	371.3

Values when pump is set at 100% pump capacity or for 60 Hz power connection and setting at 85%.

Machine Cover Safety Disconnection

The machine cover may only be removed for service and maintenance purposes. The processor cannot be started without the cover. In the event that the machine cover is removed during film-throughput, the film transport will be stopped. On the display the error message *"E1"* will be displayed. The processed film will be useless by that. The error will be reset when the machine cover has been replaced. Afterwards it could happen that the motor runs faster for a short period.

Autofill Function



In case new chemicals have to be filled into the processor (after installation, tank cleaning), the tanks can be filled automatically by means of the autofill function. Herewith, the tank is filled for a fixed period of 20 minutes, e.g. chemicals are pumped up from the replenisher tanks into the machine. Also the water bath will be filled (3 min. period). The display will show two symbolized tanks (see right). When the autofill function has been completed, the machine enters the stand-by mode. In the event of the baths being full before the time is up, the autofill function will be stopped. The level sensor in the developer bath recognize a full bath and switch off the pump. The Autofill function can also be manually stopped.

Starting up the autofill function:

1. Switch processor off.
2. Keep replenishment button (7) pressed down and switch the machine on.

Manual cancellation of the Autofill function:

1. Keep replenishment button pressed down and press “arrow down” button (3).

Manual Mode

In the manual mode the processor work without the film detection switches. The film transport has to be started and stopped manually. All the set values in the manual mode are also valid in the automatic mode. Please note that the Infeeding-film-display ("– –") is deactivated. In the manual mode the replenishment function continue working after the principle of film surface measurement. Only in the case the film detection switches are pressed the film surface measuremnt is carried out. In the manual mode a replenishment cycle can also be activated manually.

Switching to manual mode:

Switch machine on. During stand-by press arrow-buttons "up" and "down" (2 and 3) simultaneously. When in manual mode the display is flashing.

Switch back to automatic mode:

In manual mode when in stand-by press arrow-buttons "up" (2) and "down" (3) simultaneously.

Manual starting and stopping the film transport:

1. Switch to manual mode.
2. Press Processing time button (4) - button illuminates.
3. Start film transport by pressing arrow-button "up" (2) and stop film transport by pressing arrow-button "down" (3).

Manual replenishment:

1. Switch to manual mode.
2. Press replenishment button (7) - button illuminates.
3. Start replenishment cycle by pressing arrow-button "up" (2) or cancel replenishment cycle by pressing arrow-button "down" (3).

Water Save Function

With the water save function the water consumption can be reduced. If the water save function is activated there will be 50% less water consumed.

Activating the water save function:

1. Switch processor off.
2. Press the buttons processing speed (4) and dryer power (6) simultaniously and keep pressed.
3. Switch the machine on again and release the pressed buttons.
4. Activate or deactivate the water save function by pressing the arrow buttons (2 and 3). When *"0"* is set, the water save function is deactivated, when *"1"* is set, the water save function is activated.
5. For saving switch machine off again.

Stop Film Transport

In a case of a film-jam inside the machine, the film transportation can be manually interrupted. To stop the film transport press both arrow-buttons (2 and 3) simultaneously. Related topics:

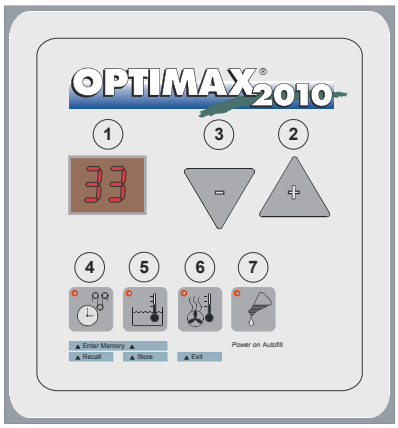
see "Manual starting and stopping the film transport:" on page 16

see "Film is caught up in the racks" on page 22

Rollfilms and Paper Films

Roll films with a polyester lead of at least 10 cm length can be transported. The adhesion must be chemical resistant.
Roll films without lead and paper-films must be folded on the corners, as shown in the diagram, before being fed into the machine.

Use of Memory Function



In the memory two sets of parameters can be stored and be recalled into working memory.

Store processing parameters

1. Set machine to preferable parameters e.g. bath tem-perature, processing time etc. (see manual).
2. Press buttons 4 and 5 “Enter Memory” simultaneously to enter the memory mode.
3. Use buttons 2 and 3 “Select” to select the Parameter memory (P1 or P2). Inside this the parameters will be stored, old values will be overwritten.
4. Press button 5 “Store” to store parameters and to leave the memory mode.

Recall processing parameters

1. Press buttons 4 and 5 “Enter Memory” simultaneously to enter memory mode.
2. Use buttons 2 and 3 “Select” to select the Parameter memory (P1 or P2) from which the parameters shall be recalled.
3. Press button 4 “Recall” to recall parameters (copy into working memory) and to leave the memory mode.

To leave memory mode without change
Press button 6 “Exit”.

Choose the same bath temperature for all stored programmes. Of course different bath temperatures can be stored too, but when changing the programme you always have to wait until the changed bath temperature is reached.

Care

Daily Care

Before use...

1. Remove dirt and dust from film-infeed with soft cloth.
2. Run 2 - 3 cleaner films through processor to remove all accumulated dirt and dust from the rollers.
3. Check the liquid level in the replenishment containers and if necessary refill.

After use...

When working has been completed at the end of the day, the water must be drained out of the machine. This reduces the growth of algae in the water bath. For that purpose open the water drainage stop cock (see page 8 bottom).

Attention: Do not allow fluids to enter the inside of the processor or contact the control panel. Fluids may damage the processor.

Weekly Care

The developer chemicals cause residue build-up in the machine. This residue has a negative effect on the developing process of the film material. For this reason the processor has to be regularly cleaned of this residue.

Do a weekly clean of the roller racks, which only takes a few minutes.

1. Switch machine off and remove cover.
2. Loosen the securing latches (red, blue and beige) of the drive shafts of each roller rack at the right side.
3. Rinse all racks thoroughly under warm running water and then leave to drain off. Use a soft sponge (do not use scouring-pad, as this would scratch the rollers!) and remove the pollution from the rollers. During this procedure, the rollers can be turned by turning the drive shaft.
4. Wipe the infeed-roller-pair (first roller-pair of developer rack) dry.
5. Replace the racks: Red = Developer, Blue = Fixer. Beige = Washing/Drying. Ensure that the racks are firmly installed and do not forget to close the securing latches on the drive shafts.
6. Replace machine cover and ensure it is securely closed.
7. Clean processor outer casing with damp cloth. Do not use aggressive cleaners or solvents.

Please note:
When removing the Rinsing / Drying roller-rack, ensure that no water gets into the film dryer air channel.

Thorough Cleaning

Depending on the quantity of films processed, a thorough cleaning is necessary every 3 - 6 months. Tank cleaners are available for developer and water baths. The fixer bath is cleaned with water. When preparing chemical tank cleaners, follow manufacturers instructions explicitly.

How to proceed:

1. Switch the machine off and empty all tanks by opening the stop cocks. Attention! Machine will not drain off, if it is swichted on.
2. Remove machine cover. When all tanks are emptied, close stop cocks again. Now fill the fixer-tank with water. Prepare cleaner solutions for developer and water baths and fill into respective tanks.
3. Remove suction pipes from the replenishment containers and place them in a water filled bucket. Attention! Do not add chemical cleaners here!
4. Close machine cover and switch machine on.
5. Start film transport (see “Manual starting and stopping the film transport:” on page 16) and keep runngin for 10 to 20 minutes. During this the installed roller racks will be cleaned.
6. Important: After completion of tank cleaning, the tank should be rinsed thoroughly with clean water. To do this, fill the machine with fresh water twice and each time, let the machine run for a 10 minute period. Empty the tanks and re-close the stop cocks.
7. Take out the roller-racks and rinse them thoroughly with running water. Remove remaining dirt from the rollers by using a sponge and clean thoroughly. Doing this, the rollers can be turned by turning the drive shaft. Wipe the infeed-roller-pair (first roller-pair of developer rack) dry. Replace the racks.
8. Refill the tanks with respective chemicals. This can be done by hand or automatically (see “Autofill Function” on page 15). Replace the suction pipes into the replenisher containers. In certain circumstances the circulation system must be ventilated: see “Test run” on page 9 item b).
9. For quality check, process test films.

Before you go on holiday...

or in the event that your processor will not be in use for longer than two weeks, all the chemicals have to be emptied out of the tanks. In case you don't want to do a complete tank cleaning at once, then fill the tanks after emptying, with water.

Attention: Do not use alcohol containing solvents to clean the machine!

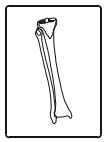
Colour changes in the containers are caused by the properties of the chemicals and no cause for concern!

Problems and Solutions

Advise on Film Defects

Your processor has been constructed for long term use. If however irregularities might occur, you will find help to locate the problem below. Please check the listed points, before calling your service-technician.

Films do not have enough density

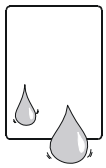


- Bath temperature is too low.
- Developing time too short.
- Replenishment rate of developer too low.
- Exposure time is too short.
- Developer chemicals are exhausted: Renew.
- Fixer solution has been mixed into developer: Renew. Clean and rinse bath well before refilling.
- Circulation system is not operating properly.

Too high a density

- Bath temperature too high.
- Developing time too long.
- Exposure time is too long.
- Replenishment rate of developer too high.
- Developer chemicals are too concentrated, mix with new developer.
- After renewing chemicals: Starter is missing.
- Circulation system is not operating properly.

Films will not dry



- If warm air comes out of air channel in the dryer, chemicals and film type should be checked.
- Fixer solution is exhausted or diluted.

Film has a yellow-green surface

- Not fixed correctly. Check the film type and fixer chemistry.
- Fixer solution is exhausted or diluted. Replenishment rate of fixer is too low.

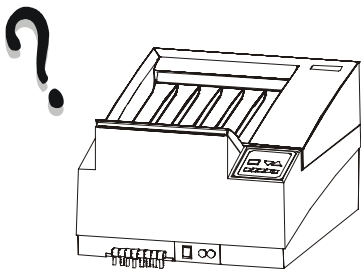
Scratches, pressure marks, dirt on film

- Prior to processing films, run cleaner films through the processor.
- Pressure marks caused by careless handling, finger nails etc.
- Rollers are polluted. Clean tanks and roller racks.

Cloudy film

- Level in developer is too low.
- First guide bar of fixer rack is dirty (condensate or crystals). Clean roller-racks.
- Developer is old or circulation not working.
- Try processing films by infeeding them with emulsion side up.

Advice on Machine Errors



Machine does not switch on

- Ensure that electrical plug is firmly inserted into socket. Ensure that electrical socket has power supply by testing with an appliance e.g. tablelight.

Rinsing water does not flow

- Open water inflow tap.
- Water pressure in the water system is too low: Pressure in the plumping system too low: Minimum pressure has to be 2 bar (29 psi).

Replenishment rate too high

- Check the programmed times of replenishment cycle and replenishment time.

Replenishment rate too low

- Check the programmed times of replenishment cycle and replenishment time.
- Check whether the machine can be started by each of the both film detection switches. In the case of a switch faulty, call your service technician. In the meantime, double the programmed replenishment time.

Replenishment pump does not pump

- Check whether the replenishment containers are full and that the end of the suction pipe is positioned under the liquid level.
- Check whether there is air in the replenishment pipes. If this is the case, then check the pipe connections.

Water tank overflows

- Water drainage hose (overflow) is bent. The hose end should be positioned above the drainage level in the syphon.›‹›‹
- Check water drainage in the tank and hose for blockage and pollution. The drainage hoses should have a constant fall.

The film does not transport correctly

- Film is fed in and gets caught in the machine: Check the positioning of the racks in the machine and make sure that the latches are closed.

Film cannot be fed, the display shows “E1”

- Close machine cover securely, paying special attention that the switch on the rear of the control panel is actuated.

Film is in the infeed and nothing happens

- Display is flashing: Control is in the manual mode. Switch back to Automatic Mode (see page 16).
- Push the film over the film detection switches deep into the infeed. Feed in the film to activate the switch. If the machine does not start use the second switch. If the processor still does not start then call your service technician. In the meantime, with limitations the processor can be worked with in the Manual Mode (see page 16).

Film is caught up in the racks

- Switch machine off and remove cover.
- Check in which rack the film is caught up in and remove the respective rack.
- If possible, catch hold of the film end by hand and by manually turning the drive-shaft, pull the film out of the rack.
- Replace the rack and secure with fastener. Replace machine cover and switch the machine on again.
- If a film is caught up in the machine due to a power cut, it can be transported out of the machine by activating the transport with a film in the infeed (machine can also be started up in the manual mode, see “Manual starting and stopping the film transport:” on page 16).

Important notice:

Ensure that the racks are firmly installed and keep the securing latches on the drive shafts closed.

Don’t operate processor with empty replenishment tanks.

After a long machine shut down check developer and fixer levels and refill if necessary.

Error Messages

Machine errors are shown on the display as abbreviations. The cause of error is explained below. For service technician: problem solution see “Trouble shooting” in service manual.

Display	Cause and possible correction
E1	Cover switch is not actuated. Place cover correctly on the machine and ensure that the cover switch behind the control panel is actuated. If the error cannot be corrected, then the cover switch may be broken.
UU	Level in the developer bath is too low. Check the bath and pump manually or fill up by hand if necessary.

English

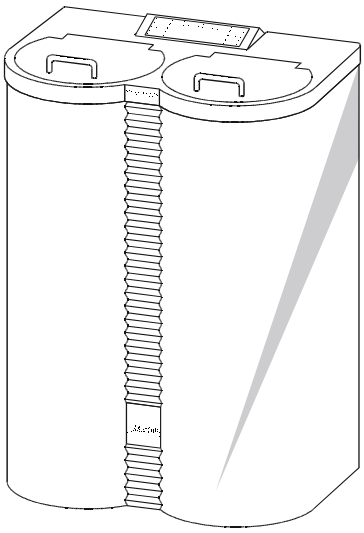
PROMIX® A40

The PROMIX® A40 is a fully automatic chemical mixing machine for preparing developer and fixer bath chemicals of either powder form or liquid concentrates. All stages are guided and controlled by means of a microprocessor. Thanks to a large reserve tank, up to 3 machines can be connected and continue to operate, without having to interrupt the working process.

Due to its patented construction, the PROMIX® A40 is easy to operate, reliable, fast and virtually service free.

The PROMIX® A40 replaces the usual replenishment tanks in the darkroom.

Ask your local dealer for more information.



Technical Specifications

Tank capacities:	each 20, 25, 30 or 40 litres
Reserve tank:	each 13 litres
Water connection:	3/4", 2 - 10 bar (29 - 145 psi)
Pump capacity:	38 l/min
Mixing times:	variable, 2, 3, 5, 10, 15, 20, 25, 30 minutes
Power source:	220-240 VAC, 200 W, 50/60 Hz Fuse: sb 2 A / 250 V
Weight:	28 kg empty, 108 kg full
Dimensions:	(WxHxD) 65 x 93 x 44 cm

AIRCLEAN® 200

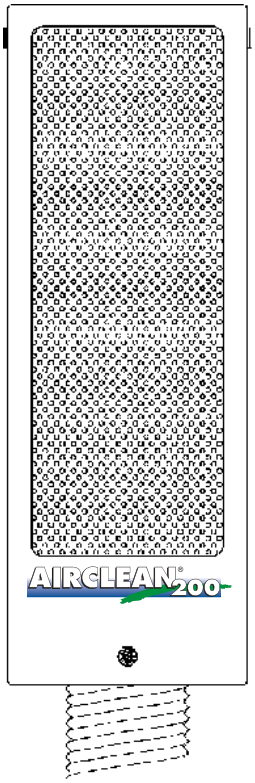
At last you can breathe again

AIRCLEAN® 200 cleans the air from your processor. Unpleasant chemical odours are absorbed through the large active charcoal filter. Allergies are prevented and you can breathe again freely.

Simple installation directly on to the processor (no breaking through the wall).

Filter exchange cheap and fast approx. every 3 months.

Ask your local dealer for more information.



Technical Specifications

Cleaning capacity:	approx. 200 m^3/hour
Filter:	Active charcoal
Power consumption:	43 W
Power source:	220-240 V, 50/60 Hz
Weight:	7 kg
Casing:	Stainless steel, plastic coated
Casing dimensions:	(WxHxD) 21 x 63 x 17 cm

Service Manual

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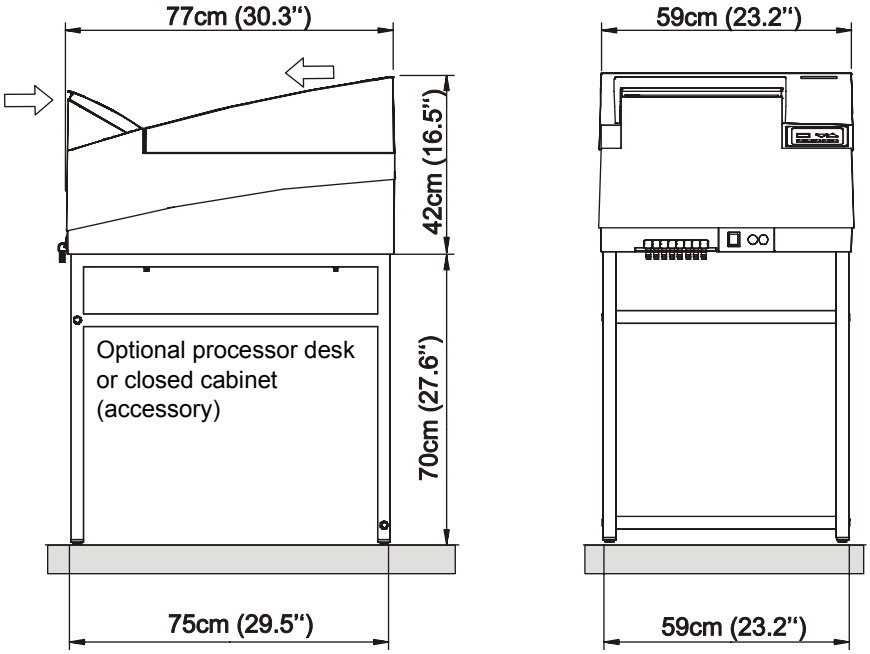
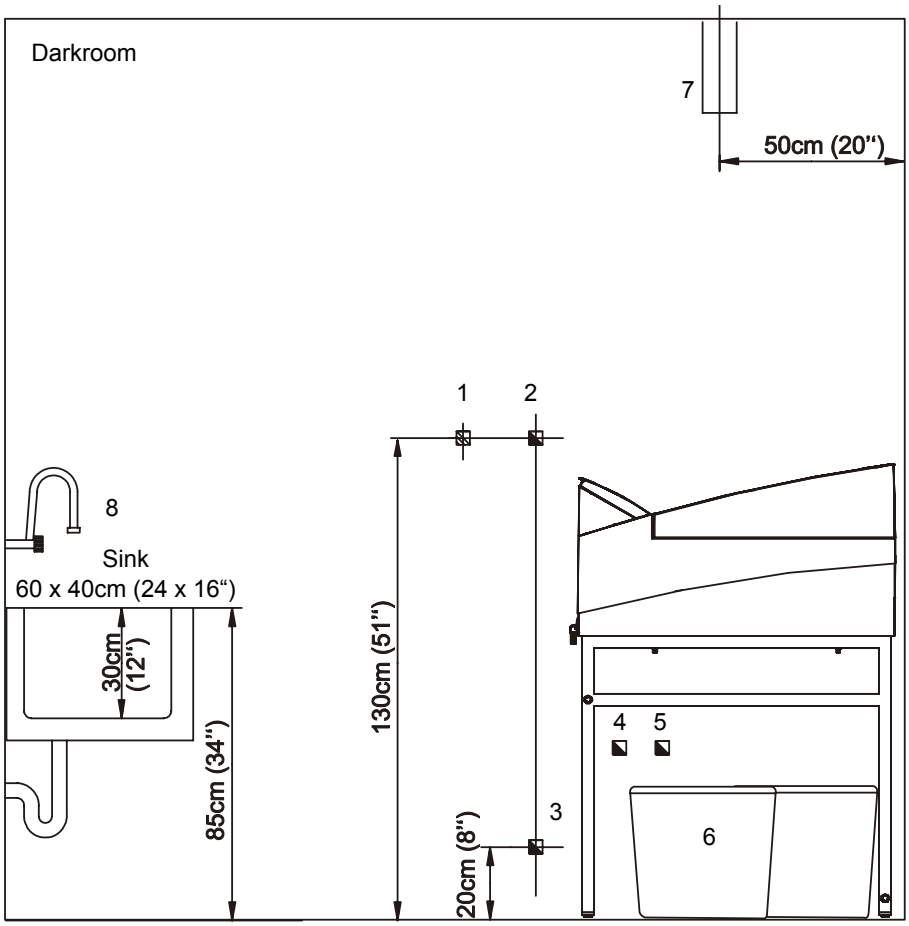
Installation Data



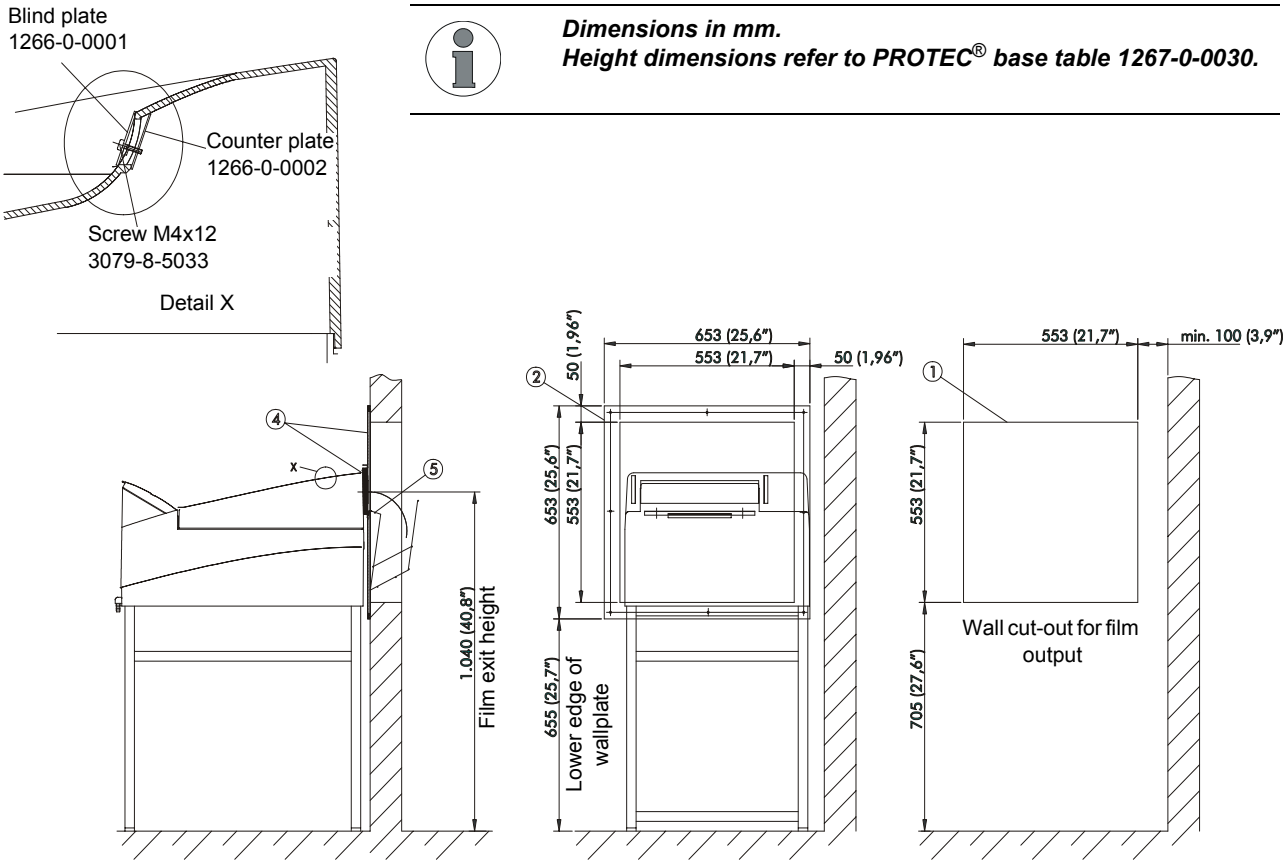
1. Wall socket
   220-240 V, 16 A resp. 110 V, 15 A (depending on machine model). Power lead should be equipped with Earth-Leakage Switch, 25 A / 30 mA nominal error-current. In addition, a power control switch can be installed.
2. Fresh water connection 3/4" with stop cock, permissible pressure 2-10 bar, water temperature 5-25 °C.
3. Drainage plastic pipe PVC ∅ 50 mm (2") incl. syphon.
4. Drainage resp. collecting containers for used developer.
5. Drainage resp. collecting containers for used fixer.
6. Storing space for replenishment tanks: Below machine or externally.
7. Ventilation of darkroom is necessary.
8. Sink with freshwater and flexible hose. Inner dimensions minimum (LxWxH) 60x40x30 cm (24x16x12").



Measures and positions are recommendations

English

Through the wall mounting “film output”
- Film output to the light room for OPTIMAX® 2010 type 116x-y-6000



Dimensions in mm.
Height dimensions refer to PROTEC® base table 1267-0-0030.

1. Wall opening according to drawing.
2. Fasten wallplate with enclosed eight screws (note markings).
3. Fix blind plate with screws and straps on the film outlet (Detail X).
4. Push processor up against wallplate and place foam rubber light protection between processor and wallplate.
5. Hang in film catch basket at wallplate from the backside.
6. Check mounting-set for light im-permeability and function.

Please note:

Pull sealing wedge off before removing machine cover.

Trouble Shooting

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1 Algae

1.1 Excessive algae growth in water tank

Algae growth inside the water tank is not only anoying, it causes increased cleaning work and leaves residue on the films. When algae growth increases, countermeasures are in demand:

- When work has been completed at the end of the day, drain water out of the machine.
- Clean dryer-water rack regularly. Use soft sponge and soap to remove residue from the rollers.
- Install a particle filter system in the fresh water supply for the processor.
- If water tank overflows due to algae growth blocking the overflow hose, then the overflow hose can directly be connected to the connection at the water tank inside the machine.
- If no other solutions can be found, then usage of Anti-Algae-Agents can be a great improvement (automatic dispensers work the best). However, it is known that cleaning agents containing chlorine may corrode rubber rollers and high-grade steel in the tank area (check before use).

2 General

2.1 Machine has no power

- Ensure that electrical socket has power supply.
- Check machine fuses.

Pleasse use as replacement fuses only the PROTEC® gold fuses. These fuses are optimized for use under existing conditions.

- While power switch is on, check the following components: Voltage on contact of main switch - if no voltage - change main switch. Check input voltage at electronics. If the voltage is normal, exchange the electronics. If no voltage is present, check the cables.

2.2 No display but circulation pumps run

- Check entry current of 5 V - on the contacts no. 1 and 8 of 8-pole-plug X18 from the control unit's PCB. If voltage is present, then exchange the control unit.
- Disconnect temperature sensor developer bath (X15) and check display again.

3 Drive

3.1 Film feed does not run, film processing started

- Display “E1”: see “Error Messages” on page 22.
- Check screwing of chain wheel on motor- and driveshaft.

3.2 Machine does not start automatically

- When machine is switched on place a film in the infeed. If the display shows two bars with decimal points, then at least one film detection switch is in order. Check each of the two film detection switches and if required exchange them.
- The display shows “E1”: The cover switch is not actuated by the latch on the cover. Cover switch has no current passage when activated: Replace.

3.3 Machine doesn't stop automatically, motor and fan run continuously

- Display is flashing: Control is in the manual mode. Switch back to Automatic Mode (see page 16).
- The display continuously shows two bars with decimal points: Operator of film switch is jammed. Readjust operator or exchange the switch. If the switches are defective, the machine can still be used in the manual mode (see page 16).
- PCB is possibly faulty - then exchange.

3.4 Drive motor does not run

- Display “E1”: see “Error Messages” on page 22.
- Cover switch has no current passage when activated: Replace.
- Check drive motor: If voltage can be detected on motor, then motor is defective.

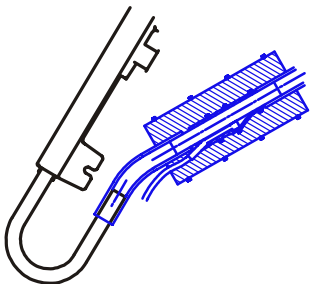
4 Baths

4.1 No circulation in bath

- Circulation pump works but no circulation in bath: Air lock in heating and circulation system. Ventilate pump.
- Particles in the pump chamber. The pump chamber can be easily opened by removing the four clips. When closing again ensure that the rubber seal is positioned correctly and not damaged.
- Check connection of pump, circulation pump possibly defective.

4.2 Developer temperature too high

- Check attachment of temperature sensor. This should be firmly positioned on tube and completely covered with foam rubber.
- Check sensor: Check voltage between pin 3 (brown) and pin 2 (white). At ambient temperature the voltage must be approx.0.3 V.
- If the sensor has no fault then electronic is defective.



4.3 Developer temperature too low

- Check circulation pump. Air lock in the circulation pump: Ventilate pump (see page 9). If no circulationcan be detected: Check wiring of circulation pump, pump possibly defective.
- Bath is not heated: Check temperature safety switch on heat-exchanger. Check heating element: Current flow resistance should read approx. 66 Ω.
- Check temperature sensor (see 4.2).
- If no error can be found then electronic is possibly defective.

4.4 Developer temperature too low, fixer temperature too high

- Air lock in the circulation pump: Ventilate circulation (see page 9).

4.5 Developer bath temperature too high or too low (display shows values of 21 °C or 40 °C)

- Check temperature sensor. Sensor is either not connected or defective.

4.6 Switch over from °C to °F

The developer temperature can be displayed in °C as well as in °F.

Switch over of temperature unit:

1. Switch processor off.
2. Keep buttons processing time (4) and developer temperature (5) pressed down and switch the machine on.
3. Set requested unit by means of the arrow buttons (2 and 3). C for Celcius and F for Fahrenheit.
4. Switch machine off to store the displayed unit.

4.7 Calibration of bath temperature / actual bath temperature is different from displayed value

Differences between displayed temperature and measured value in the developer bath can be adjusted. An adjustment may be necessary for example after exchanging the bath temperature sensor. A calibration should be carried out, if the difference is higher than +/- 0.5 °C and certainly has to be done if the difference is higher than +/- 1.5 °C.

Calibration process

1. Switch processor off. While pressing developer temperature button (5) switch machine on. Display will show developer temperature in 1-degree-steps measured by sensor.
2. Measure actual temperature inside developer bath using a calibrated thermometer.
3. At first adjust displayed value in 1-degree-steps using the arrow buttons (2 and 3). To activate the display of the decimal place, press developer temperature button (5). Do the fine calibration with the arrow buttons by adjusting this value.
4. Switch machine off to store the calibration.

4.8 Developer level switch constantly displays “UU”

- Follow tips at 6.1 “Replenishment pump does not work or works insufficiently”, page 32.
- Developer level sensor is not correctly positioned. Switch point is below the developer overflow. Adapt the height of the level switch.
- Level switch is defective (e.g. permanently closed).
- If all mentioned things are correct - exchange power PCB.

5 Film defects

5.1 Films will not dry

- Check adjusted value for the dryer power (“99” means maximum dryer power).
- No air comes out of air channel: Check wiring of dryer fan, fan is possibly defective.
- Cold air comes out of air channel: Check wiring of heating element in the air channel, heating element possibly defective (resistance should read approx. 45 Ω).
- Hot air comes out of air channel, but the film is still not dried to satisfaction. Check chemicals and film type. If this leads to no solution then the transport speed of the machine can be reduced.

5.2 The film does not transport correctly

- Check the positioning of the racks in the machine and make sure that the latches are closed.
- Check the roller racks: Position of the guide elements, rollers are in correct position and are not loose, flat springs are not bent, all gears are in place.
- Motor runs: The worm gear of the drive shaft should be secured with a splint to avoid twisting. Check the screws and positioning of the chain and chain wheel.

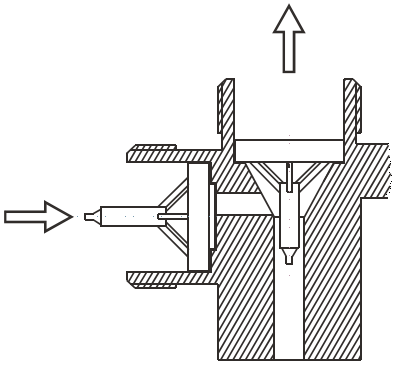
5.3 Scratches, pressure marks, dirt on film

- Straight scratches in the infeed direction indicate faulty guide elements. Check each rack and straighten up the guide elements. If mechanically damaged, replace the guide elements.
- Pressure marks caused due to polluted or damaged rollers. Check rollers for visible damage. Rubber rollers sometimes swell up. Exchange defective rollers.

6 Replenishment

6.1 Replenishment pump does not work or works insufficiently

- Clean valve inside connection tube.



Install valve insert correctly: Pay attention to flow-through direction!

- Check filter in the suction pipe (repl. container) and clean it if necessary.
- Replenishment pump sucks air in. Check hoses and connections.
- If this is the case, Check the connections.
- Check eccentric position. Flow rate reads 240 ml/min at maximum eccentric position 100% (60 Hz: 240 ml/min at 85 %!),
- Activate replenishment (in the manual mode) and while on, check the voltage of connection X6 (replenishment pump) at the power PCB. If no voltage can be registered - exchange power PCB. Remark: At 2-pump-version: Developer replenishment pump is connected to X6 and fixer pump to X5..

7 Dryer

7.1 Dryer fan does not function or runs with reduced speed

- Check the correct connecting of the fan cables: *bl = blue; bk = black; br = brown*.
- If the fan is connected improperly, then the fan runs only half power.

8 Water

8.1 Rinsing water does not flow

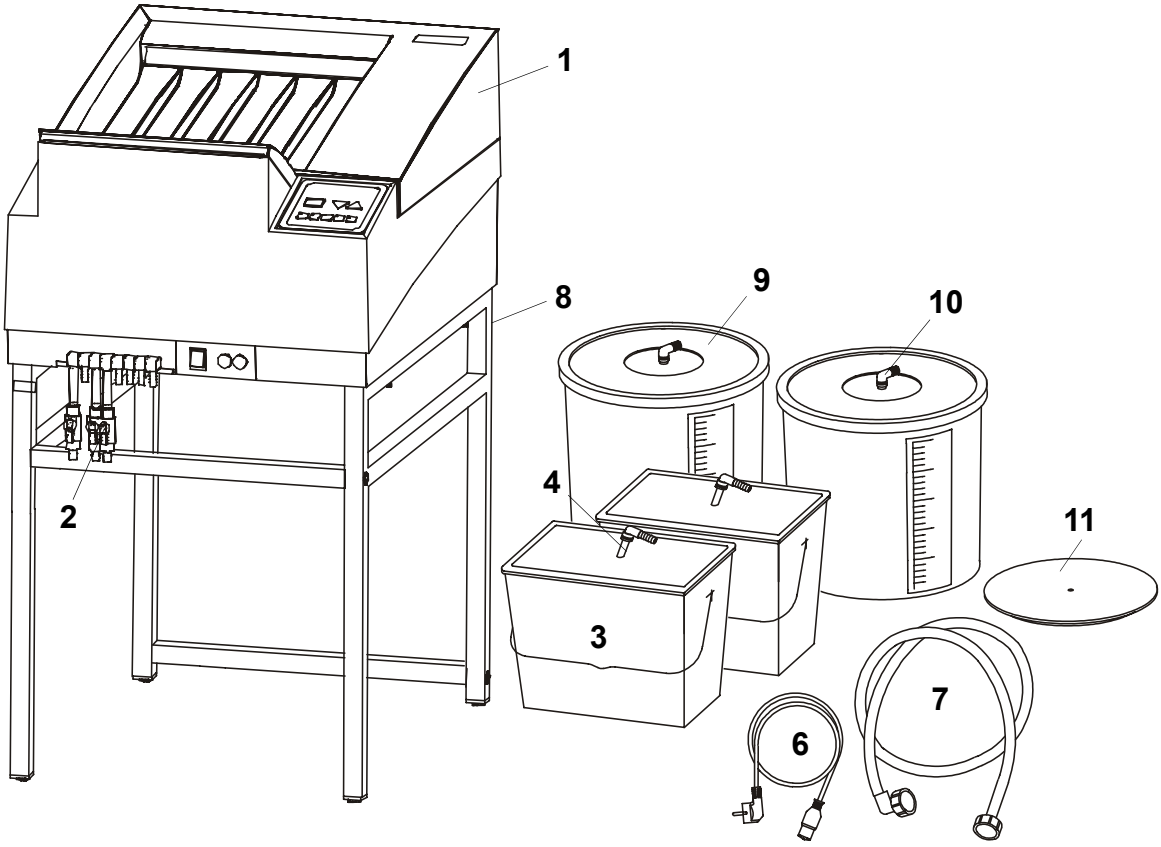
- Water pressure in the water system is too low: Minimum pressure 2 bar (29 psi).
- Valve activates, no flow passage - filter at inflow is blocked.
- Check green water inlet hose inside the machine.
- Water level switch is not in the correct position: switch point is to low (below overflow) - no fresh water inflow.
- Level switch is defective (e.g. permanently closed).
- Start machine in manual mode and measure voltage of connection X4. If no voltage can be registered - exchange power PCB.

8.2 Water tank overflows

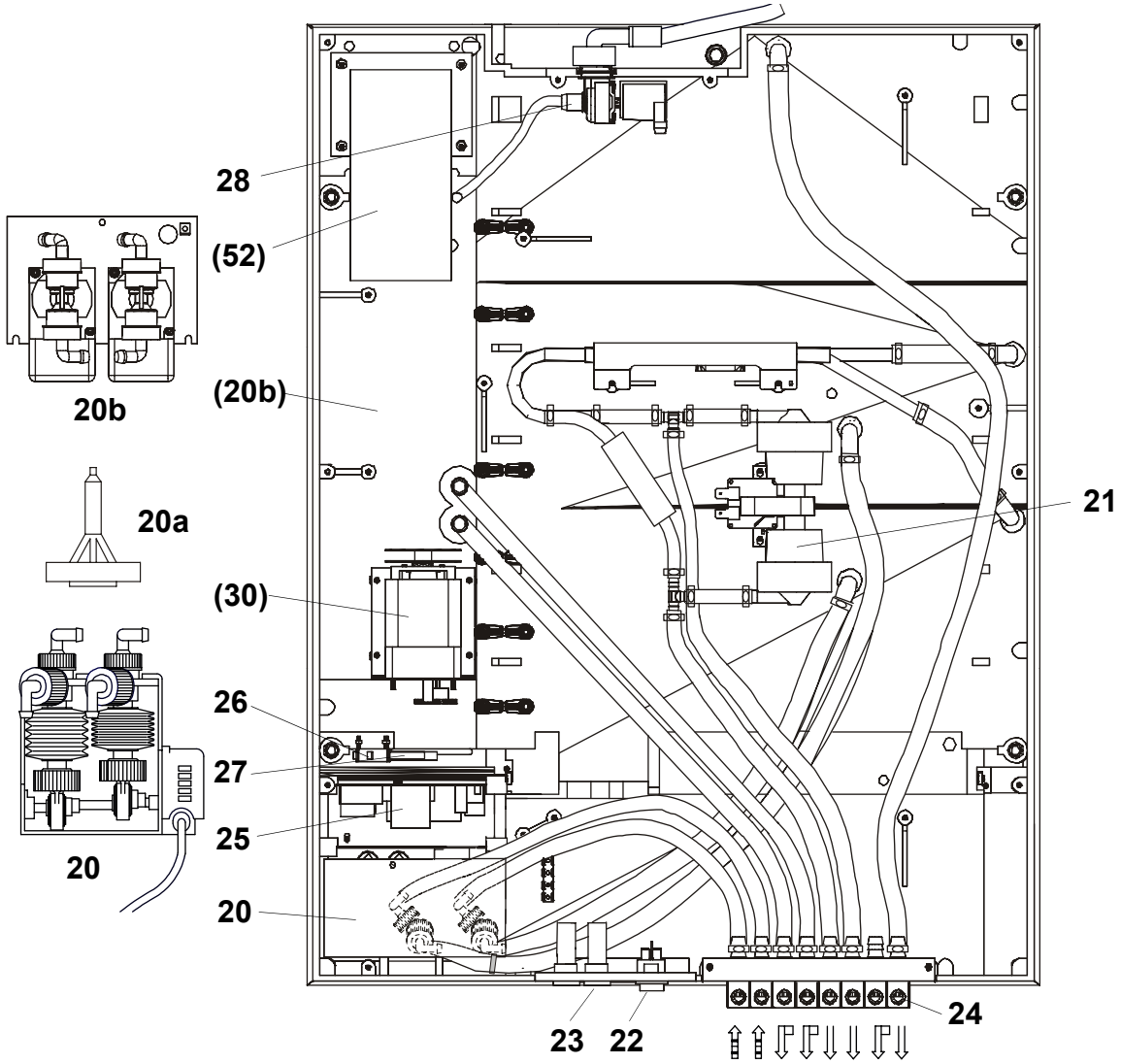
- Water drainage hose (overflow) should have a constant fall. The hose end should be positioned above the drainage level in the syphon.
- Check water drainage in the tank and hose for blockage and pollution.
- When extreme algae growth is noticed, the overflow can be connected directly at the back of the water tank.

8.3 Rinsing water constantly switches on and off

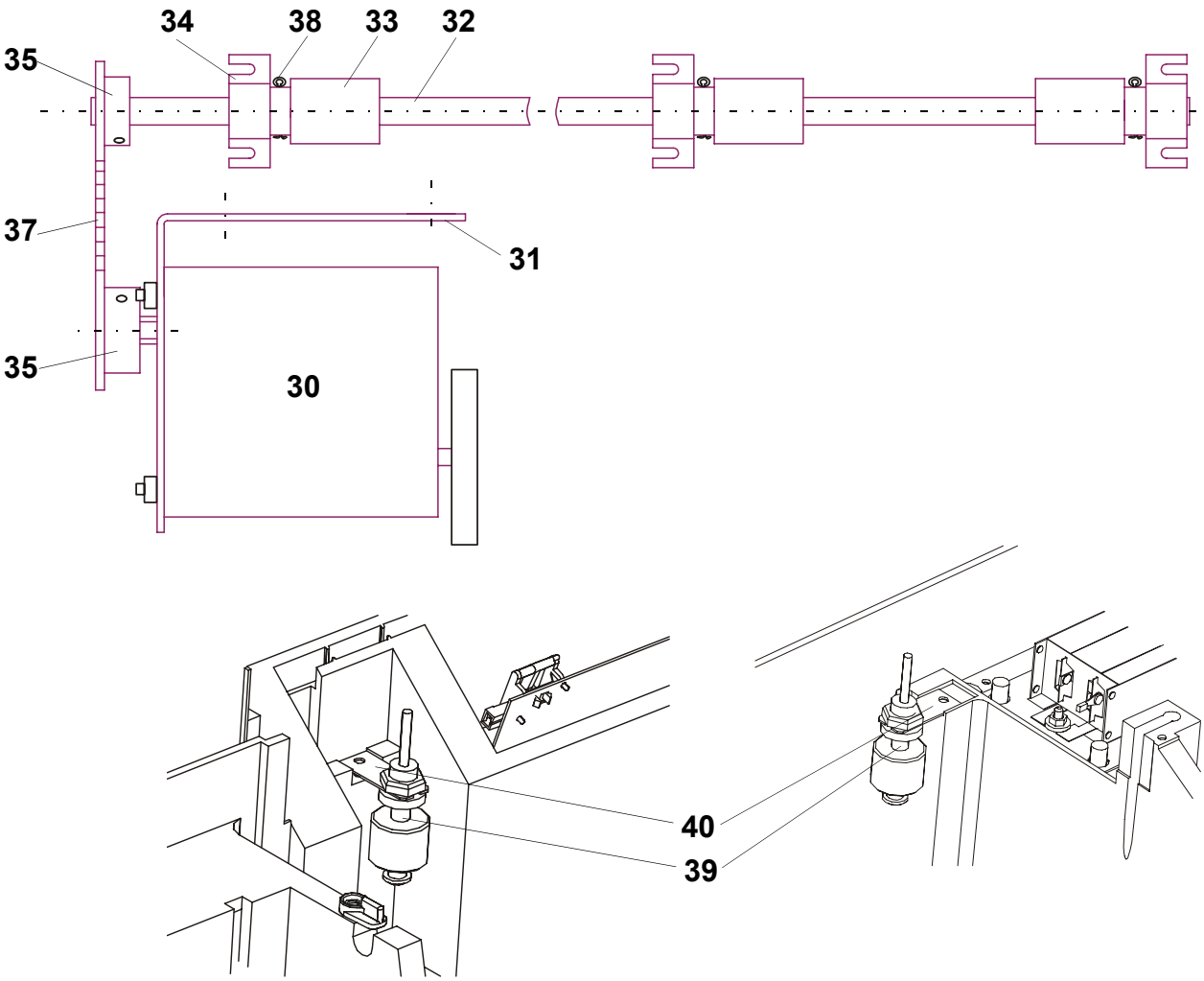
- In periodical intervals (approx. 1 minute on and 1 minute off): Water save mode is activated.
- In irregular and short intervals: Level sensor is not correctly positioned (excact at the height of the overflow). Insert roller rack. If error continuously appears - adapt the height of the level switch.



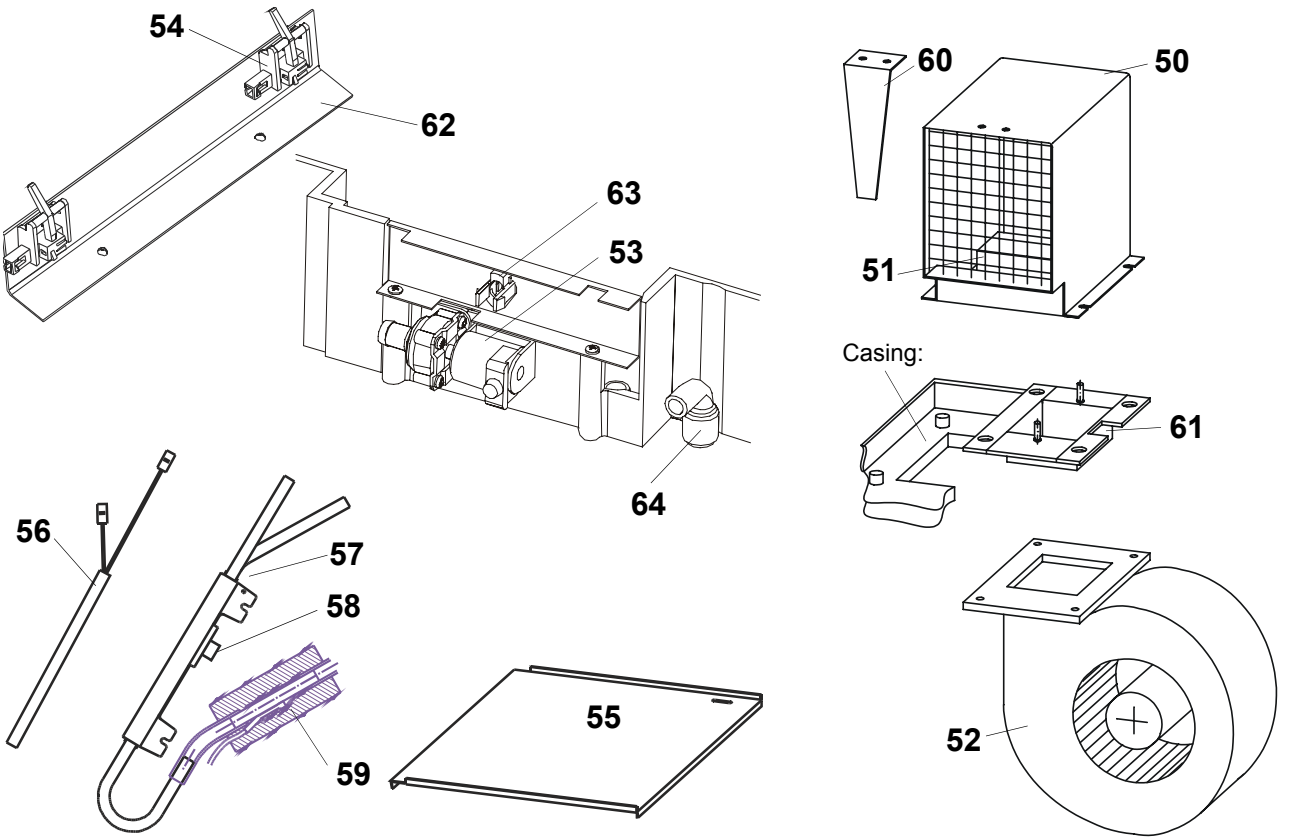
Pos.	Order No.	Description:
1	1160-0-0200	Cover complete
2	2006-0-0005	Drain stop cock 10 mm
3	1170-0-2000	Replenishment tank 12 l dev.
	1170-0-2100	Replenishment tank 12 l fix.
4	1170-0-1750	Suction pipe w. filter f. 12 l tank
6	2004-0-0010	Electrical power lead 220-240 V
	2004-0-0021	Electrical power lead 110-120 V
7	2018-0-0001	Water inlet tube
8	1267-0-0030	Processor stand
-	1267-0-0040	Closed base cabinet
9	1101-0-2000	Replenishment tank 25 l dev.
	1101-0-2100	Replenishment tank 25 l fix.
10	1101-0-1700	Suction pipe w. filter f. 25 l tank
11	1101-0-4100	Floating cover developer
-	2018-0-0012	Hose 10 x 2 mm, celar, reinforced
-	2018-0-0009	Hose 10 x 2 mm, blue, reinforced
-	2018-0-0008	Hose 10 x 2 mm, red, reinforced
-	2018-0-0005	Hose 4 x 1 mm, green
-	2018-0-0003	Hose 9 x 2 mm, clear
-	2022-0-0004	Tube clamp
-	2022-0-0019	Wire tube clamp
-	2015-0-0001	Floating balls



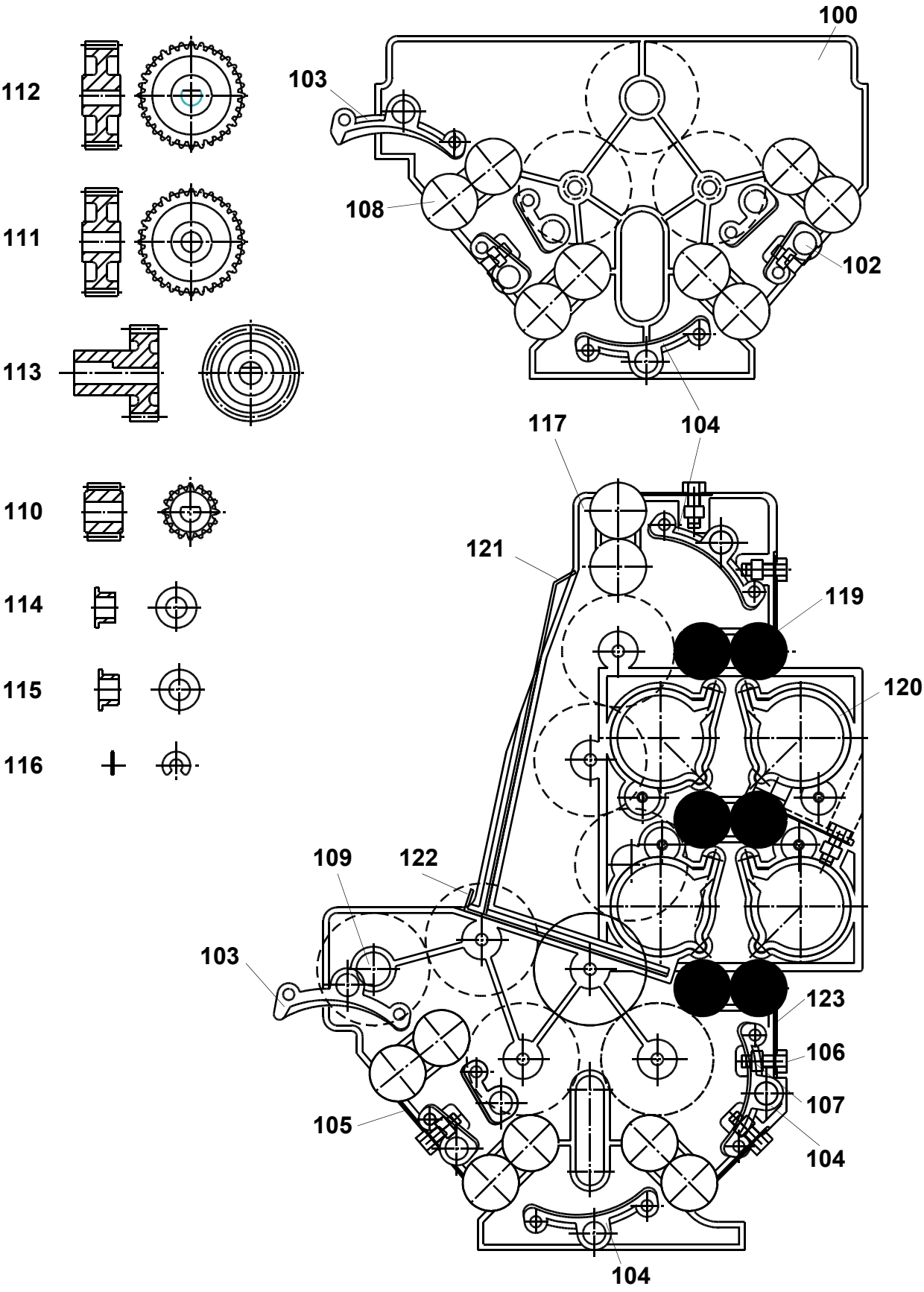
Pos.	Order No.	Description:
20	0202-1-0008	Replenishment pump 2KBA 220-240 V, 50/60 Hz
	0202-6-0008	Replenishment pump 2KBA 115 V, 50/60 Hz
20a	0002-1-0008	Valve insertion f. pos. 20
20b	0202-5-0002	Replenishment pump KBR-3X, 220-240 V, 50/60 Hz
	0202-6-0002	Replenishment pump KBR-3 115 V, 50/60 Hz
21	2002-1-0016	Circulation pump 220-240 V, 50/60 Hz
	2002-6-0016	Circulation pump 110 V, 50/60 Hz
22	2028-0-0023	Main switch 220-240 V
23	2010-0-0004	Fuse holder
-	2010-0-0010	Fuse slow blow in gold, T 10A/250V
-	2007-0-0004	Safety cover for fuse holder
22+23	2028-0-0036	Main switch 110-120 V
24	1160-0-0702	Angle connection (alu)
25	0160-5-1300	Electronic 220-240 V
	0160-6-1300	Electronic 110-120 V
-	1160-0-0705	PVC plate (PCB)
26	0170-0-2400	Micro-switch (cover) 230 V
	0170-4-2400	Micro-switch (cover) 115 V
27	2007-0-0010	Operator for micro-switch
28	2021-0-0001	Screw-in connector



Pos.	Order No.	Description:
30	2001-1-0004	Main drive motor 220-240 V, 50 Hz
	2001-2-0004	Main drive motor 220-240 V, 60 Hz
	2001-6-0004	Main drive motor 120 V, 50/60 Hz
31	1170-0-1101	Motor bracket
32	1170-0-1501	Drive shaft worm-gear
33	1170-0-1503	Worm-gear
34	1170-0-1502	Bearing block
35	1170-0-1506	Chain wheel t=12
	1170-0-1504	Chain wheel t=14
	1170-0-1505	Chain wheel t=16
	1170-0-1102	Chain wheel t=17
	1170-0-1507	Chain wheel t=18
37	2037-0-0002	Chain 6 mm with coupler link
38	3000-9-4013	Split pin 2.0x20 mm, inox
39	2012-0-0013	Level switch
40	1120-0-1502	Bracket for level switch

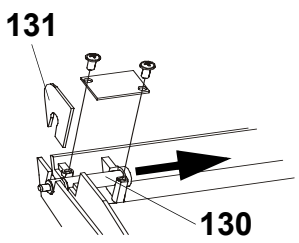


Pos.	Order No.	Description:
50	1170-0-1301	Air channel
51	2003-5-0006	Heating elment 230 V, 1100 W
	2003-6-0007	Heating element 110 V, 900 W
52	2008-5-0007	Dryer fan 220-240 V, 50/60 Hz
	2008-6-0007	Dryer fan 115 V, 50/60 Hz
53	1160-5-1900	Solenoid valve 220-240 V, 50/60 Hz
	1160-6-1900	Solenoid valve 115 V, 50/60 Hz
54	2007-0-0015	Film detection switch
55	1160-0-0105	Film feed tray
56	2003-5-0002	Heating element 230 V, 800 W
	2003-6-0002	Heating element 120 V, 400 W
57	1130-0-2101	Heat exchanger
58	2005-0-0005	Temperature safety switch mounted on heat exchanger
59	0190-0-2200	Temperature sensor
60	1170-0-1303	Plate for air channel
61	1170-0-1302	Channel dryer heating
62	1160-0-0801	Bracket for film detection
63	2027-0-0012	Traction relief
64	1160-0-0710	Angle fitting rubber

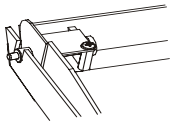


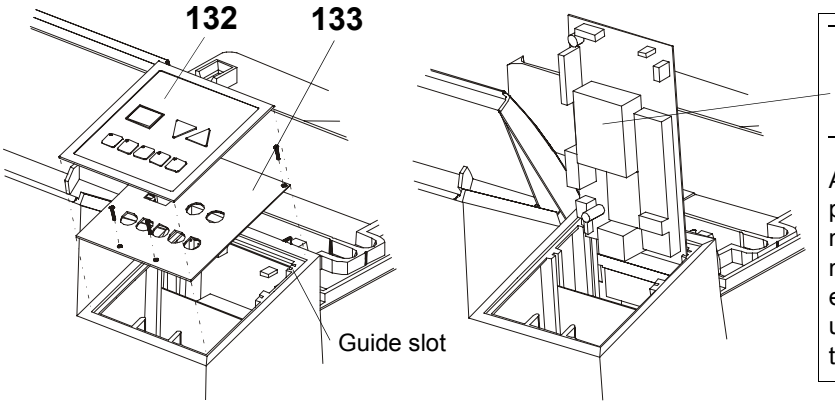
Standard roller racks

Pos.	Order No.	Description:
		Standard Processor
-	1170-0-0300	Roller rack, developer
-	1170-0-0400	Roller rack, fixer
-	1170-0-0600	Roller rack, dryer
		Mammography Processor
-	1171-0-0600	Roller rack, dryer
		Graphic Arts Processor
-	1172-0-0300	Roller rack, developer
-	1172-0-0600	Roller rack, dryer
100	0170-0-0301	Dryer side plate left w. shafts
	1170-0-0301	Side plate dev. (right)
	0170-0-0401	Dryer side plate left w. shafts (left)
	1170-0-0401	Side plate fix. (right)
102	1140-0-3800	Guide bar straight, short
103	1140-0-4500	Guide bar with nose
104	1140-0-3700	Guide bar, curved
105	1170-0-0304	Flat spring 55
106	3079-8-5013	Screw M4x10, A4
107	3009-3-4023	Hexagon nut M4, A4
108	1140-0-0301	PU-roller 35 ground
109	1170-0-0310	Drive shaft rack
110	1101-0-0302	Gear t = 16, D-hole
111	1101-0-0304	Gear t = 32, round hole
112	1101-0-0303	Gear t = 32, D-hole
113	1170-0-0302	Worm wheel
114	1101-0-0305	Bearing bush
115	1101-0-0317	Bearing bush, black
116	2014-0-0001	Circlip
117	0170-0-0601	Dryer side plate left w. shafts
	1170-0-0602	Dryer side plate right
119	1140-0-0302	Rubber roller 35
120	1140-0-0605	Air jet (35)
121	1170-0-0604	Dryer plate, large
122	1170-0-0603	Dryer plate, small
123	1170-0-0303	Flat spring 35



The light protection cover can be dismantled. It is necessary to take it apart to have access to the film detection switches and the developer level sensor. For dismantling take out the circlip (131) on the right side (!) of the cover and then pull the stop bolt (130) inwards out of the mounting. Now the cover can be taken out upwards. Remark: The left stop bolt will remain completely assembled.





Attention!
Heat sink is not grounded!

After the control PCB is removed the power PCB can be taken out. Please do not take out the connected power PCB more than shown in the diagramm. For easy handling there is a guided slot in the upper part of the body. In case of service the board can be inserted there.

Pos.	Order No.	Description:
130	1160-0-3103	Stop bolt
131	1160-0-3106	Cover for ligh protection cover
132	2011-0-0137	Control panel foil
-	2011-0-0139	Control panel foil 2 pumps
133	0160-9-1200	Control panel

Tips and Tricks

Removal of Control PCB

To reach the screws of the control PCB remove the film over the keyboard in the front area about 20 mm (lift up) (see left diagram at the top).

Stop start-cycle

The start-cycle (after switching the machine on) can be manually interrupted. To stop start-cycle, press both arrow-buttons (2+3) simultaneously. The start-cycle may only be interrupted for service purposes.

Display of machine information

When during the start-up cycle one of the arrow-buttons is pressed then various machine information will be displayed.

Arrow button “Up”:

As long as the button is pressed the software version will be displayed.

Arrow button “Down”:

As long as the button is pressed the quantity of processed films will be displayed. Please pay attention to the decimal point - the display has only two digits so the numbers must be converted:

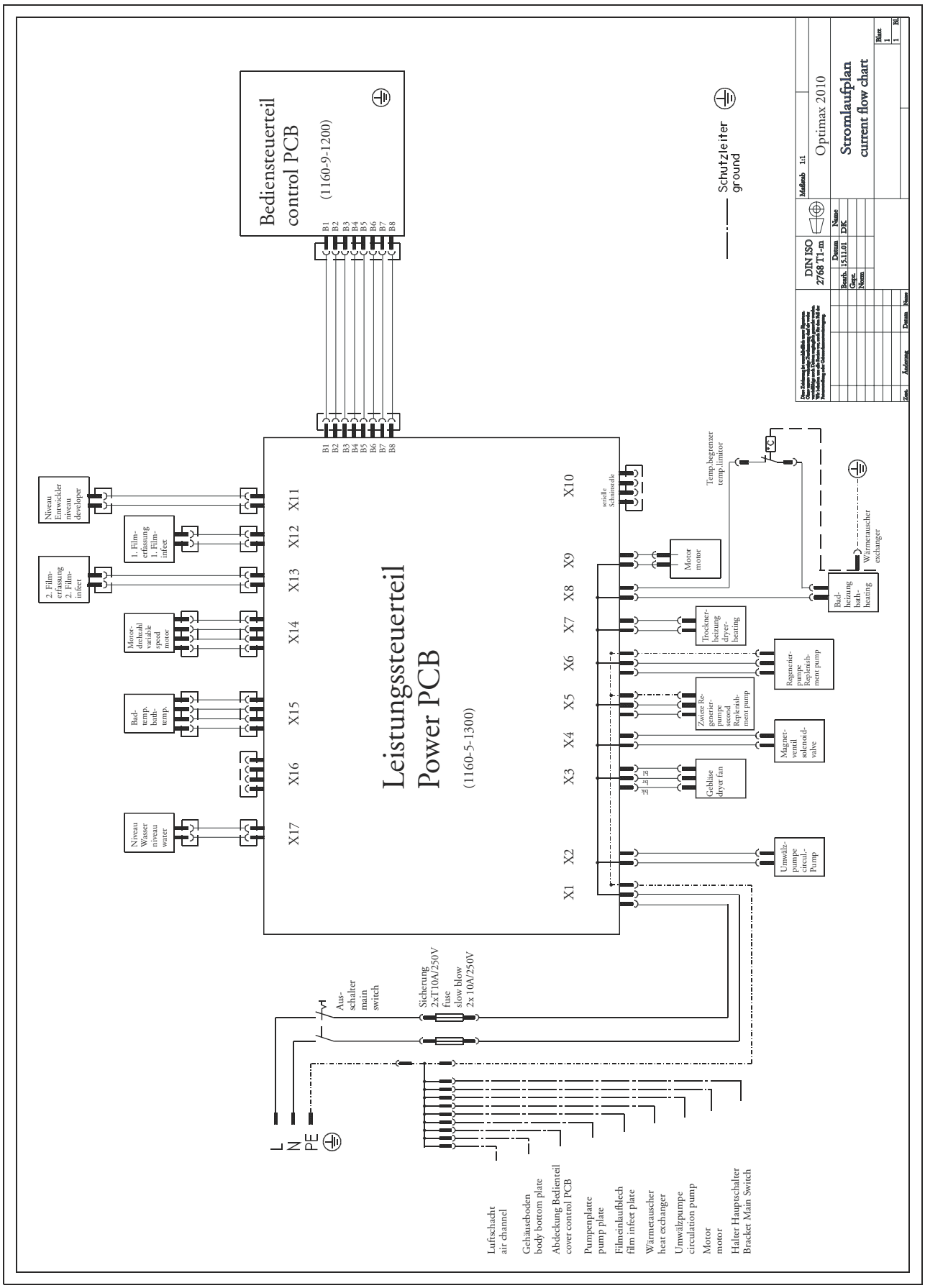
XX : value x 10 = film quantity

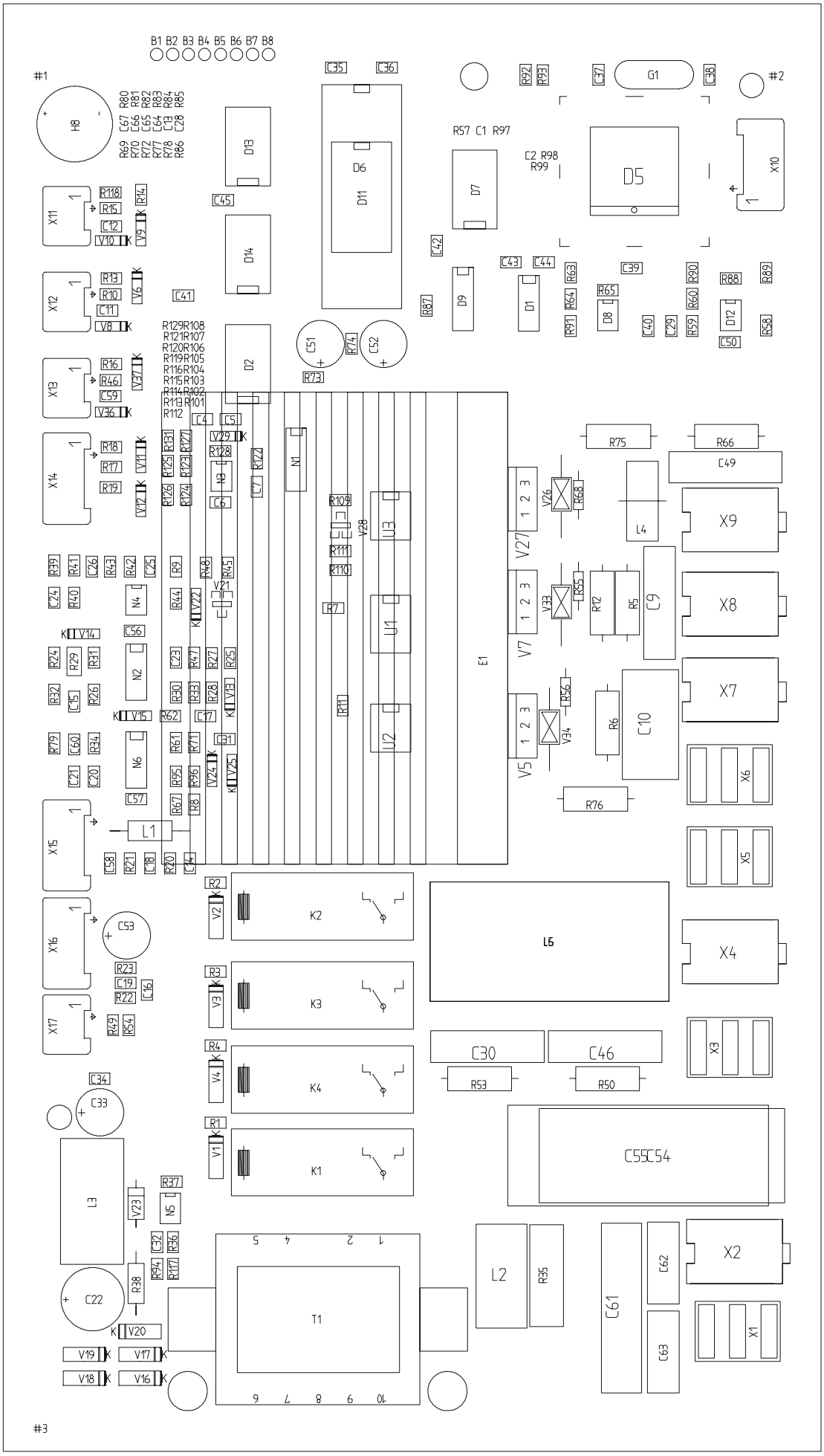
XX. : value x 100 = film quantity

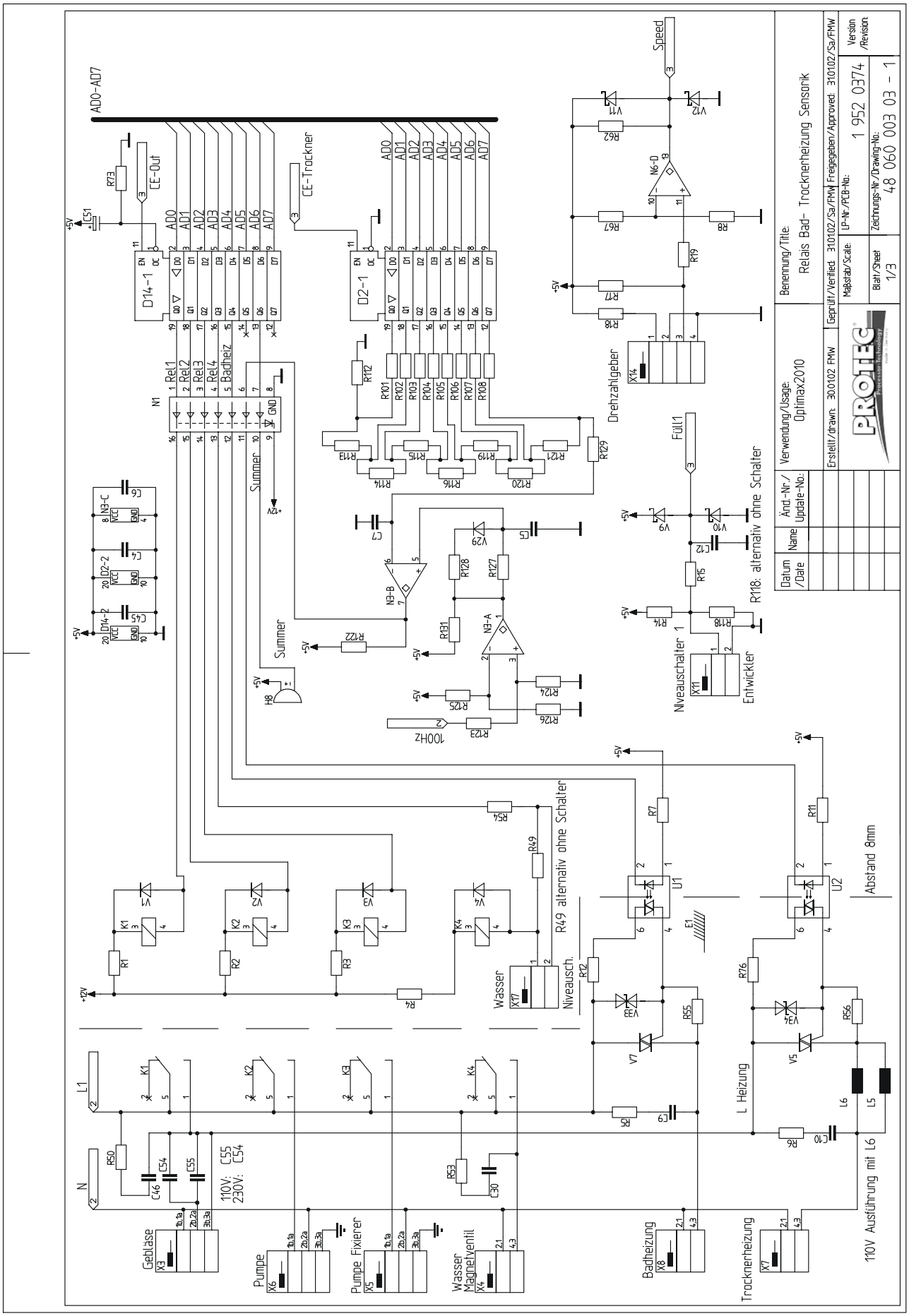
X.X : value x 1.000 = film quantity

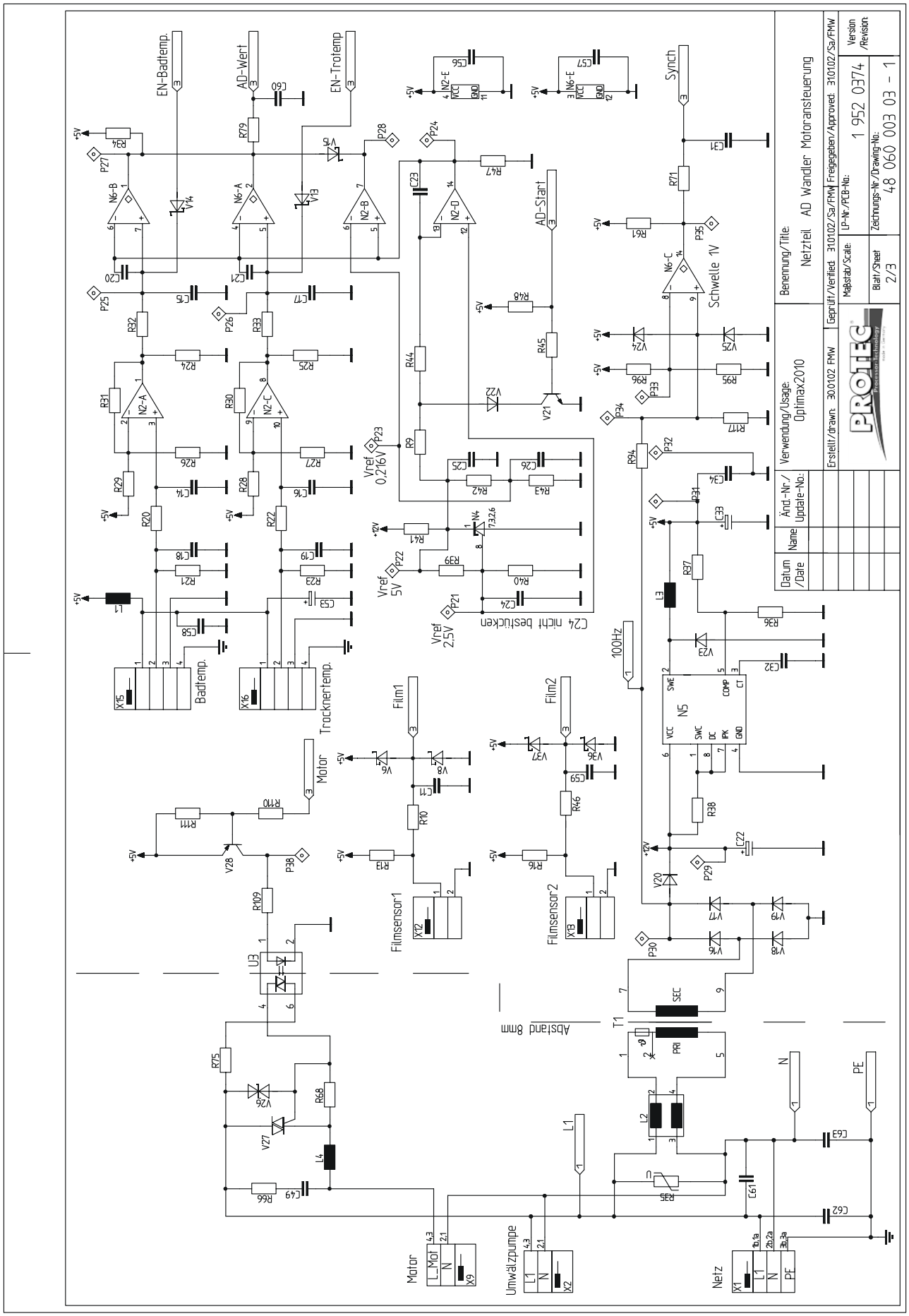
X.X. : value x 10.000= film quantity

9.9. : more than 990,000 films

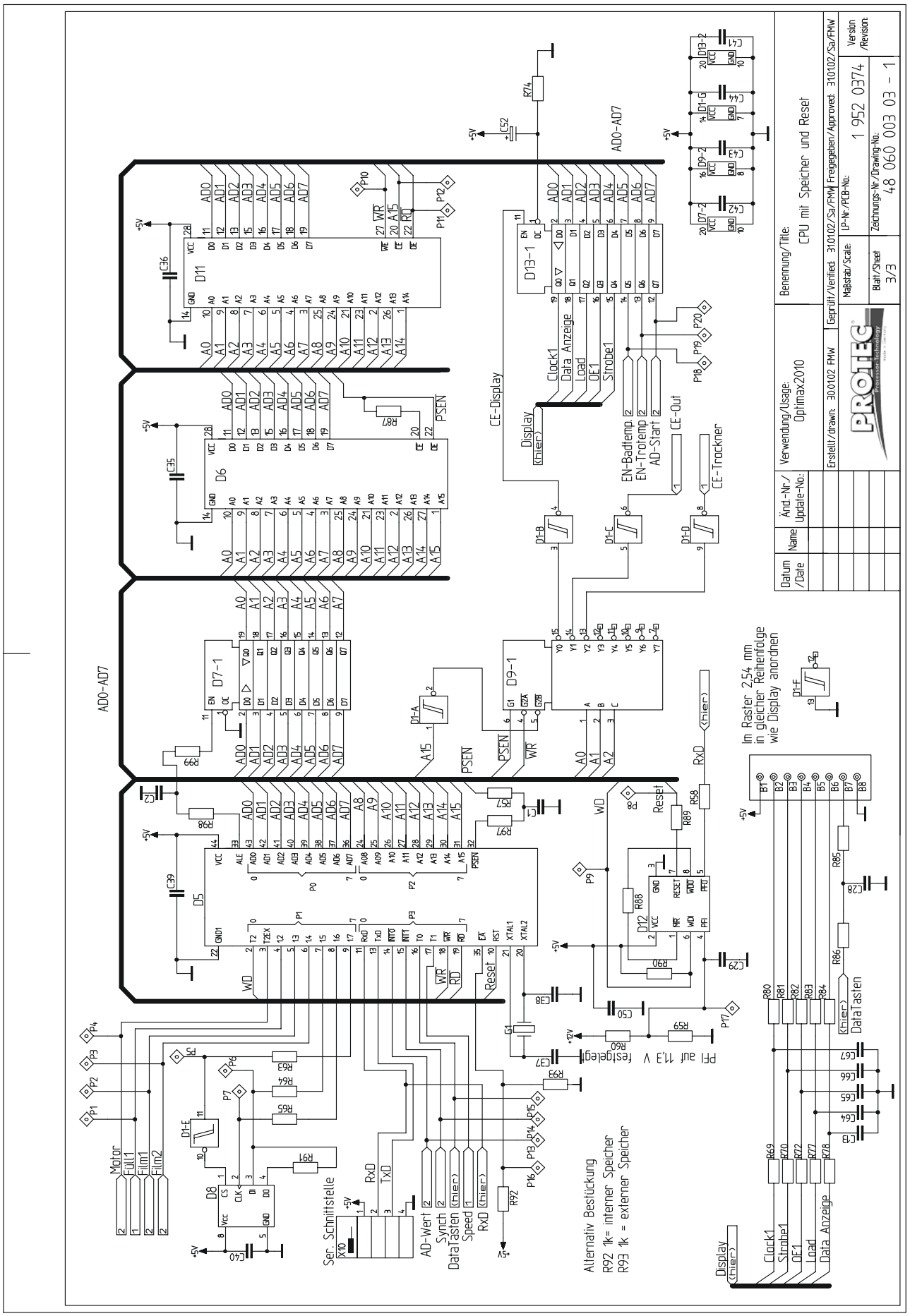

Bediensteuerteil
control PCB
(1160-9-1200)
B1 B2 B3 B4 B5 B6 B7 B8
Schutzleiter
ground
Optimax 2010
Stromlaufplan
current flow chart
DIN ISO 2768 T1-m
Leistungssteuerteil
Power PCB
(1160-5-1300)
X1 X2 X3 X4 X5 X6 X7 X8 X9 X10
X11 X12 X13 X14 X15 X16 X17
Niveau Entwickler niveau developer
1. Film-erfassung 1. Film-infeet
2. Film-erfassung 2. Film-infeet
Motor-drehzahl variable speed motor
Bad-temp. bath-temp.
Niveau Wasser niveau water
Motor motor
Temp.begrenzer temp.limitor
Wärmetauscher exchanger
Bad-heizung bath-heating
Trockner-heizung dryer-heating
Regenerier-pumpe Replenish-ment pump
Zweite Regenerier-pumpe second Replenish-ment pump
Magnet-ventil solenoid-valve
Gebläse dryer fan
Umwälz-pumpe circul-Pump
Aus-schalter main switch
Sicherung 2xT10A/250V fuse slow blow 2x 10A/250V
L
N
PE
Luftschacht air channel
Gehäuseboden body bottom plate
Abdeckung Bedienteil cover control PCB
Pumpenplatte pump plate
Filmeinlaufblech film infeet plate
Wärmetauscher heat exchanger
Umwälzpumpe circulation pump
Motor motor
Halter Hauptschalter Bracket Main Switch


B1 B2 B3 B4 B5 B6 B7 B8
#1
#2
#3
H8
G1
D5
D6
D11
D7
D13
D14
D2
D9
D1
D8
D12
X1
X2
X3
X4
X5
X6
X7
X8
X9
X10
X11
X12
X13
X14
X15
X16
X17
T1
E1
L1
L2
L3
L4
L5
L6
K1
K2
K3
K4
C55C54
C30
C46
R53
R50
R75
R66
R76
C49
C9
C10
V27
V7
V5
V26
V33
V34
V28
U1
U2
U3
N1
N2
N3
N4
N5
N6
C22
C53
C33
C34
V20
V19
V17
V18
V16


Benennung/Title:
Relais Bad- Trocknenheizung Sensorik
Verwendung/Usage:
Optimax2010
Ersteltt/drawn: 30.0102 FMW
Geprüft/Verified 310102/Sa/FMW
Freigegeben/Approved: 310102/Sa/FMW
Maßstab/Scale:
LP-Nr./PCB-No.: 1 952 0374
Blatt/Sheet 1/3
Zeichnungs-Nr./Drawing-No.: 48 060 003 03 - 1
Version /Revision:
Datum /Date
Name
Änd.-Nr./ Update-No.:
AD0-AD7
CE-Trockner
CE-Out
Speed
Drehzahlgeber
Summer
Füll1
Niveauschalter 1
Entwickler
R118: alternativ ohne Schalter
R49 alternativ ohne Schalter
Wasser
Niveausch.
Abstand 8mm
L Heizung
110V Ausführung mit L6
110V: C55
230V: C54
Gebläse
Pumpe
Pumpe Fixierer
Wasser Magnetventil
Badheizung
Trocknerheizung

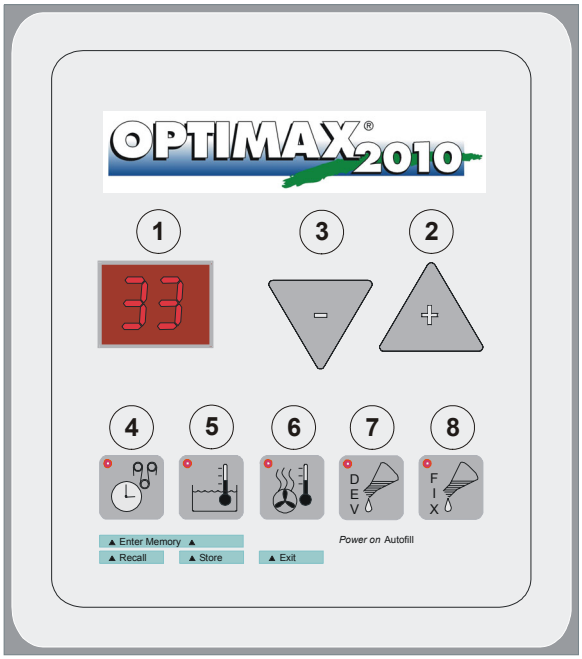

Benennung/Title:
Netzteil AD Wandler Motorsteuerung
Verwendung/Usage:
Optimax2010
Geprüft/Verified: 310102/Sa/FMW
Erstellt/drawn: 300102 FMW
Freigegeben/Approved: 310102/Sa/FMW
LP-Nr./PCB-No: 1 952 0374
Zeichnungs-Nr./Drawing-No: 48 060 003 03 - 1
Maßstab/Scale:
Blatt/Sheet 2/3
Version /Revision:
Änd.-Nr./ Update-No:
Name
Datum /Date
EN-Badtemp.
AD-Wert
EN-Trotemp
Synch
AD-Start
Schwelle 1V
Vref 0,216V
Vref 5V
Vref 2,5V
C24 nicht bestücken
100Hz
Badtemp.
Trocknertemp.
Motor
Film1
Film2
Filmsensor1
Filmsensor2
Abstand 8mm
Motor
Umwälzpumpe
Netz
L_Mot
N
PE
L1

English


Benennung/Title:
CPU mit Speicher und Reset
Verwendung/Usage:
Optimax2010
Erstellt/drawn: 30.0102 FMW
Geprüft/Verified: 310102/Sa/FMW
Freigegeben/Approved: 310102/Sa/FMW
Maßstab/Scale:
Blatt/Sheet 3/3
LP-Nr./PCB-No.: 1 952 0374
Zeichnungs-Nr./Drawing-No.: 48 060 003 03 - 1
Version /Revision
Datum /Date
Name
Änd.-Nr./ Update-No.:
AD0-AD7
CE-Display
CE-Out
CE-Trockner
EN-Badtemp.
EN-Trotemp
AD-Start
Clock1
Data Anzeige
Load
OE1
Strobe1
Display
PSEN
WR
RD
WD
Reset
RxD
TxD
Motor
Full1
Film1
Film2
Ser. Schnittstelle
AD-Wert
Synch
DataTasten
Speed
PFI auf 11,3 V festgelegt
Im Raster 2,54 mm
in gleicher Reihenfolge
wie Display anordnen
Alternativ Bestückung
R92 1k= interner Speicher
R93 1k = externer Speicher

Differences of OPTIMAX 2010 Standard (1160-1-0000) and OPTIMAX 2010 with two pumps (1160-1-2000)

1. Control panel



① Display working parameters
② Arrow button “Up” = increase parameter
③ Arrow button “Down” = decrease parameter

Mode Buttons
④ Processing time in minutes
⑤ Developer temperature in °C
⑥ Dryer power in %
⑦ Replenishment time fixer
⑧ Replenishment time fixer

2. Replenishment time

The replenishment function and the adjustment of the replenishment time follow in the same principle as the standard version.

3. Spare parts list

1. In service-manual page 34, pos. 20: Bellow pump with one bellow: **0202-5-0003 (pos. 20b)**.
2. EPROM: 1160-0-0001